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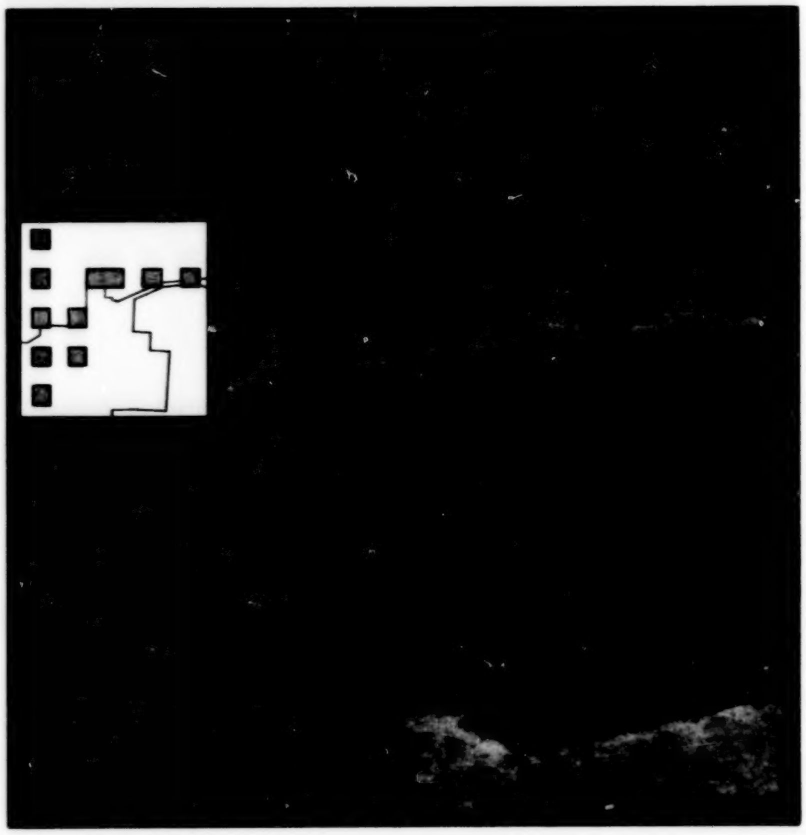

Cost Analysis of Archeological Activities at Eight Southeastern Sites

by Linda F. Carnes, Roy S. Dickens, Jr.,
Linda France, Ann Long

Supervised and Edited by Roy S. Dickens, Jr.

1986

Research Laboratories of Anthropology University of North Carolina, Chapel Hill

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TECHNICAL ABSTRACT

An analysis of costs for archaeological activities at eight selected Southeastern sites was conducted between September 1984 and May 1985. The cost analysis was executed by personnel from the Research Laboratories of Anthropology, University of North Carolina at Chapel Hill, under contract with the Department of the Interior, National Park Service. The management data produced by this study is designed for use by Federal land managing agencies to assign penalties for site/resource destruction. Costs for archaeological activities are determined by an assessment of quantitative data from each site. The sites represent different physiographic regions, cultural periods, stratigraphic complexity, and context situations. This data, obtained from extant field and laboratory records, site personnel interviews, administrative records, and published/unpublished reports, includes monetary costs and person hours for archaeological activities. Activities related to planning, primary and secondary excavation, laboratory processing, artifact analyses, special services (C^{14} dating, mechanical backfilling, contracted services), report preparation, and overhead/support are assessed in costs and person hours expended. In summary, comparative costs of archaeological activities between university projects, government projects, and private-sector projects are presented. Costs per cubic volume of soil (ft, yd, and m) are also calculated, as well as cost per specimen for each test site.

MANAGEMENT SUMMARY

The following is an analysis of the costs of archaeological activities at eight selected Southeastern sites. This project was conducted between September 1984 and May 1985 by personnel of the Research Laboratories of Anthropology, University of North Carolina at Chapel Hill, under contract with the Department of the Interior, National Park Service (NPS).

The management data in this study is designed for use by Federal land managing agencies to provide "clear and objective guidance regarding the assessment of Civil penalties pursuant to the Archaeological Resources Protection Act of 1979; Final Uniform Regulations (43CFR7, 36CFR296, 18CFR1312, and 32CFR229, Federal Register, January 6, 1984)."

Quantitative data for each site was obtained from a review of all extant field and laboratory records, interviews with site personnel, examination of administrative records, and review of all published and unpublished reports. Person hours and other costs for each site were calculated for activities related to planning/logistics, primary excavation, secondary excavation, laboratory processing, artifact conservation, analyses, special services, final report preparation and support. Costs were also obtained for equipment and supplies, travel and housing, and production of the final report. Area and volumes of all excavated soils were computed where appropriate in cubic feet, cubic yards, and cubic meters.

As outlined in the scope of work for this project: Planning activities consisted of, but were not limited to, time spent organizing a research design, contract negotiations, site preparations, establishing vertical/horizontal controls, and other appropriate activities; Primary excavation included such activities as shovel work in general excavation units, sifting excavated soils, processing flotation samples, data recording (photography, plotting, and mapping), collecting special samples, and overall field supervision; Secondary excavation activities included troweling general units, excavation and sifting soils from postholes, features, burials, pits, etc., and recording data related to secondary excavation activities; Laboratory activities included washing, sorting, cataloging, preparation for analysis, preservation/conservation treatments, and restoration; Analysis (where appropriate) included activities related to identification, classification, comparison, and interpretation of all recovered materials; Special Services activities included contracted analyses of floral and/or faunal materials, Radiocarbon dating, and sometimes, mechanical backfilling of a site (if a contract was required for such services); Report Preparation included time and costs spent for compilation of data, writing and typing of the final field report, final drafting activities for the report, preparation of photographic plates, and assembling and duplication of the final report; and finally, Support activities included person hours and costs for one administrative secretary and/or curator to process all field and laboratory data forms, photographic materials, employment forms, invoices, and often typing of the final report. A summary of management data is provided in Table 1.

Table 1. Management data summary, prior to cost adjustments (see Chapter 10).

	Wall Site 31Or11 (Chapter 2)	Upper Sauratown Site 31Sk1a (Chapter 3)	Warren Wilson Site 31Bn29 (Chapter 4)	Cold Morning Site 31Nh28 (Chapter 5)
County and State	Orange Co., NC	Stokes Co., NC	Buncombe Co., NC	New Hanover Co., NC
Physiographic Region	Piedmont	Piedmont	Mountains	Coastal Plain
Site Type	Palisaded Village	Palisaded Village	Palisaded Village	Ossuary
Cultural Components	Woodland-Protohistoric	Historic	Mississippian (Multi-Component)	Middle Woodland
Field Season	1983	1972	1973	1979
Institution/Agency	RLA	RLA	RLA	RLA (for NPS)
Personnel				
P.I.	Roy S. Dickens, Jr.	Joffre Coe	Joffre Coe	Joffre Coe
Field Archaeologist	Trawick Ward	Bennie Keel	Trawick Ward	Trawick Ward
Field Assistant	R.P. Stephen Davis, Jr.	Keith Egloff	Jeanette Runquist	Jack Wilson
Lab Supervisor	R.P. Stephen Davis, Jr.	Keith Egloff	Trawick Ward	Jack Wilson
Consultant/Other	5 Grad. Students	Volunteers	Grad. Students	Martha Graham
Crew Size (avg.)	12 Students	11 Students	7.5 Students	6 Students
Total Volume Excavated	2,196.85 ft^3	4,866.0 ft^3	2,962.0 ft^3	1,006.03 ft^3
Total Person Hours	6,116.9	8,215.5	5,607.0	3,318.0
Total Projected Cost	$55,083.33	$22,576.32	$15,285.56	$19,504.08
1984 Cost Equivalent	$56,845.99	$55,581.46	$36,430.04	$29,783.83
Cost per Unit (#) (Size of Unit)	$3,060.18 (18) (10x10 ft)	$705.51 (32) (10x10 ft)	$727.88 (21) (10x10 ft)	$1,625.34 (13) (12- 2x2 m, 1- 2x4 m)
Cost per ft^3	$25.07	$4.64	$5.16	$19.39
Cost per yd^3	$677.03	$125.27	$139.34	$523.60
Cost per m^3	$895.52	$165.70	$184.29	$684.35
Cost per Specimen	$2.30	$0.43	$0.43	$14.37
Specific Factors Affecting Cost	Field school/unpaid students; Three P.I.s; Extensive analysis; Teaching time involved; Field/lab techniques standard; Midden zone required more screening.	Paid student labor; Field/lab techniques standard; No artifact analysis; Testing & excavation involved; Estimated lab time; Many features/burials increased secondary excavation.	Field school/unpaid students; Teaching time involved; Field techniques standard; Estimated lab time; No artifact analysis; Complex stratigraphy and many features and burials.	Salvage excavation under CRM contract; Paid student labor; Consultant involved; Extensive analysis; Unusual field situation (ossuary pit); Excavation and testing.

Table 1 Continued.

	Garden Creek Mound 31Hw1 (Chapter 6)	Daniels Island Site 38Bk397 (Chapter 7)	Edgewood Site 9Da89 (Chapter 8)	Third Halifax Jail Site 31Hx1, H-122 (Chapter 9)
County and State	Haywood Co., NC	Berkley Co., SC	Dekalb Co., GA	Halifax Co., NC
Physiographic Region	Mountains	Coastal Plain	Piedmont	Coastal Plain
Site Type	Mound-Village	Domestic House (Rural)	Garbage Dump (Urban)	Extant Jail Building (Urban)
Cultural Components	Mississippian	Historic, c.1899	Historic, c.1911	Historic, c.1838
Field Season	1965	1984	1976	1984
Institution/Agency	RLA	Garrow and Associates (for S.C. DOT)	Georgia State University	N.C. Dept. of Cultural Resources
Personnel				
P.I.	Joffre Coe	Patrick Garrow, et al.	Roy S. Dickens, Jr.	Terry Harper
Field Archaeologist	Bennie Keel	Linda France	Gary Barber	Linda Carnes
Field Assistant	Jefferson Reid	Keith Reiner	Kelly Lohman/Elton Gannaway	-
Lab Supervisor	Brian Egloff	Linda France	Linda H. Worthy	Linda Carnes/Cassandra Richards
Consultant/Other	Volunteers	Michael Scardaville	Student volunteers	4 Technicians
Crew Size (avg.)	7	5	3	5
Total Volume Excavated	9,549.57 ft^3	1,336.1 ft^3	832.0 ft^3	2,287.02 ft^3
Total Person Hours	7,819.7	2,502.4	3,874.2	2,719.5
Total Projected Cost	$16,620.32	$106,321.74	$13,014.99	$31,160.97
1984 Cost Equivalent	$54,082.01	-Same-	$24,118.48	-Same-
Cost per Unit (#)	$54.31 (306)	$2044.65 (52)	$6,507.49 (2)	$31,160.97 (1)
(Size of Unit)	(5x5 ft)	(47- 5x5 ft, 5- 5x2.5 ft)	(10x10 ft)	(entirety, 27x27 ft)
Cost per ft^3	$1.74	$79.58	$15.64	$13.62
Cost per yd^3	$46.99	$2,148.78	$422.29	$367.89
Cost per m^3	$62.15	$2,842.07	$558.58	$486.58
Cost per Specimen	$0.11	$9.10	$0.37	$0.54
Specific Factors Affecting Cost	Paid student labor; Complicated mound stratigraphy; Standard field techniques; Estimated lab time; 20-yr old data; Soil volumes estimated.	Private-sector project; All paid technicians; 2 co-P.I.s; 1 project manager; Higher overhead costs; Survey, testing & excavation; Consultants paid; All phases of analysis completed.	CRM contract with university; Some paid students and some volunteers in field; Dense midden increased secondary excavation and sifting; Extensive analysis; Unpaid analysts; Retirement and overhead.	State government contract; All paid technicians; All phases of work completed; No conservation of artifacts; Two consultants paid; No housing/travel costs; Work inside standing structure; Dense midden zone.

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FOREWORD

One of the duties of the Departmental Consulting Archeologist is to coordinate archaeological activities within the Department of the Interior and other Federal agencies so that they are performed in the most effective and efficent way possible. One way of improving the effectiveness of archaeological activities is to share with others information that is particularily useful. This publication aims to do this.

Under contract to the Archeological Assistance Division, National Park Service, the Research Laboratories of Anthropology at the University of North Carolina at Chapel Hill has prepared detailed cost analysis for archaeological activities undertaken at a variety of archaeological sites in the southeastern United States. This information may be helpful to archaeologists and others planning for various kinds of archaeological activites. It presents a comparative scale against which they can estimate the likely costs of work they are planning to conduct. The information may also assist archaeologists, law enforcement personnel, and Federal land managers who are faced with the task of estimating the damage to archaeological sites that illegal digging and looting have caused.

We hope that the information will be widely applicable and useful. Comments on the publication are welcome. They should be addressed to: Chief, Archeological Assistance Division, National Park Service, P.O. Box 37127, Washington, D.C. 20013-7127.

Bennie C. Keel
Departmental Consulting Archeologist
Assistant Director, Archeology,
National Park Service

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PREFACE

Archaeologists, because they work on tight budgets and contend with so many unknown factors, are very cost conscious. Even with these fiscal concerns, however, many of the same archaeologists tend not to keep detailed records of expenditures on some phases of their research projects. Whereas, field work time and effort usually are well documented, laboratory processing and report writing time and effort often are not recorded. This discrepancy is especially true of universities, where, because of teaching responsibilities and frequent turn over of students, it often takes a long time to complete all phases of a project; where the same people may work on several projects at the same time; and where there may be considerable donated time and volunteer labor.

The Research Laboratories of Anthropology (RLA), University of North Carolina, Chapel Hill, which conducted most of the projects used in the present study, has maintained better than average records of project time and effort. These records are best for field aspects of the work because of the use over many years of a standard Daily Report form that accounts for '"person hours" devoted to all categories of field work activity. Records on the laboratory - analysis - report writing end of projects, however, have not been as complete. In cases where there were gaps in the records this study made every possible effort to obtain credible estimates. We interviewed site personnel, consulted budget and personnel officers, and poured through massive amounts of project files, and otherwise exhausted all sources of information to develop accurate data. Where the estimates are less secure, conservative figures are given.

To my knowledge, no other comparative cost analysis of archaeological work has ever been undertaken. This study, therefore, should provide a datum for similar projects in other parts of North America and the world. Archaeological sites are an irreplaceable and non-replenishable reservoir of knowledge. As can be see herein, the dollar value of that knowledge far exceeds the value of a few pots and arrowheads that a vandal may obtain through illicit excavation. This study provides an objective basis for assessing the costs of conducting work and therefore objective data for estimating appropriate penalities and fines.

The authors express their gratitude to the many individuals who shared in the successful completion of this project. Numerous people contributed valuable site specific data. This essential information expanded the existing data base at the RLA and subsequent interpretations for this project. Specifically, we would like to express our thanks to the staff and students of the RLA for management data on the 1983 excavations at the Wall site (31Or11). Detailed supplementary data on excavations at the Upper Sauratown site (31Sk1a) were provided by Keith Egloff, Virginia Historic Landmarks Commission; Jack Wilson, Historic Sites Section, N. C. Department of Cultural Resources; Steve Davis, RLA; and Bennie Keel, NPS, who also provided relevant information on costs and person hours for the 1965 excavations at the Garden Creek Mound site (31Hw1). Trawick Ward and Homes Wilson, RLA, provided management data for the Cold Morning site project (31Nh28). Supplementary data for the Edgewood site (9Da89) were obtained from Linda H. Worthy, Rich's, Inc.; and Benetta Turner, Georgia State University Employment Records Office. Permission to use data from the 1984 work at the Daniels Island site (38Bk397) was granted by Michael Trinkley, South Carolina Department of Highways and Public Transportation and Barbara and Patrick Garrow, Garrow and Associates, Inc. Information on the Third Halifax Jail site (31Hx1-H-122) was provided by Terry Harper and Jack Wilson, Historic Sites Section, North Carolina Department of Cultural Resources.

All of the previously acknowledged members of agencies and institutions also contributed general comments and information about salary ranges and position titles for archaeological activities in Southeastern universities, state government offices, and private sector companies. In addition, Bruce Rippeteau, Director and Glen Hanson, Jr., Archaeologist, Institute of Archaeology and Anthropology, University of South Carolina, Columbia, provided comparative salary and position information for their institution. Ian Van Essen and Thomas Hargrove, Archaeological Research Consultants, Inc. provided comparative information on salaries and positions for their firm. Patricia Sanford of Colonial Williamsburg, Patti Kandle and Norman Barka of the College of William and Mary, and Bruce Larson with the Virginia Research Center for Archaeology provided data for Virginia. Comparative data from federal government agencies was obtained from Bennie Keel, NPS.

Finally, there are those individuals whose special talents were called upon to put together the finished product. We would like to thank Janet C. Hightower for her excellent cartographic work. To Estella Stansbury, Administrative Secretary for the RLA, we would like to extend our thanks for her invaluable assistance, secretarial skills, and general administrative information. Roy S. Dickens, Jr., Director, RLA and Principal Investigator, edited the first draft report, and he and Linda Carnes prepared the photographic plates.

Roy S. Dickens, Jr.
Director
Research Laboratories
of Anthropology

CHAPTER 1

Review of Federal Laws and Regulations Relevant to this Study and Research Design

Legislative and Regulatory Requirements

This report has been prepared to assist the National Park Service in enforcing Federal legislation which calls for the protection of archaeological sites (and specimens deposited therein) on Federal or Native American owned land. It has been determined that these sites are vulnerable to destruction by unqualified persons whose interest is in obtaining artifacts for hobby or commercial purposes rather than for contributing information to the archaeological data base. In response, to these needs, statutes have been enacted and regulations promulgated to insure that archaeological excavation of these sites is conducted only by qualified professional archaeologists whose objectives are in keeping with professional ethics concerning the treatment of excavated data and materials.

The Archaeological and Historic Preservation Act of 1974 requires that Federal agencies notify the Secretary of the Department of the Interior if "its activities in connection with any Federal construction project or federally licensed project, activity, or program may cause irreparable loss or destruction of significant scientific, prehistorical, historical, or archaeological data" (AHPA, Sec. 3 (a)).

Additional legislation has responded more specifically to the destruction of sites and ensuing loss of information by unqualified persons. The Archaeological Resources Protection Act of 1979 (ARPA) was set forth in order "to secure" the protection of archaeological resources and sites which are on public lands and Indian lands" (93 Stat 721, 16 USC 470aa, Sec. 2 (b)). To provide this protection, the Act requires that persons desiring to excavate sites on lands under Federal management or lands held by Native Americans must obtain permission via application to the Federal land manager (93 Stat 721, 16 USC 470cc, Sec. 4 (a)). In the event that any person violates this procedure, the Act calls for the assessment of a civil penalty by the Federal land manager (93 Stat 721, 16 USC 470ff, Sec. 7 (a) (1)). This fine should be assessed "taking into account, in addition to other factors, (A) the archaeological or commercial value of the archaeological resource involved, and (B) the cost of restoration and repair of the resource and the archaeological site involved" (93 Stat 721, 16 USC 470ff, Sec. 7 (a) (2) (A) (B)).

The Final Uniform Regulations of this Act (CFR) set forth requirements for implementation of the Act. With respect to the assessment of penalties Section 14 of the regulations requires that the archaeological value of a site or resource to be determined according to the value of the information associated with the archaeological resource. This value is the costs of the retrieval of scientific information which would have been obtainable prior to the violation. In addition the commercial value of the resources destroyed or removed and the cost incurred in restoration or repair of archaeological resource will also be considered in the assessment of civil penalties.

Research Design

The first phase of the Research Design involved the selection of eight archaeological sites for which there were suitable data for cost analysis. Variation in site type, physiographic setting, recovery techniques, excavation conditions, and institutions and personnel were sought for comparative purposes. In addition, there was a requirement of 1,000 ft^2 or 100 ft^3 of excavation, or 500 person hours of effort, expended on archaeological activities. Based on the above criteria and the available management data, twenty candidate sites were submitted to the Technical Project Officer for final selection of eight. Of the eight sites chosen three are historic Euroamerican sites and five are prehistoric, or historic aboriginal sites (Figure 1). The Euroamerican sites consist of: 1) a domestic house site (38Bk397), 2) a small urban dump (9Da89), and 3) the interior of a standing structure (31Hx1-H-122). The aboriginal sites represent: 4) a late prehistoric village site (31Or11), 5) an early historic village site (31Sk1a), 6) a deeply stratified, multicomponent camp or village site (31Bn29), 7) a prehistoric ossuary site (31Nh28), and 8) a late prehistoric platform mound site (31Hw1).

Following site selections, a data collection instrument was developed to systematically compile the management data necessary for cost analysis. To facilitate data manipulation, person hours were divided into five broad task categories: Planning, Fieldwork, Laboratory Work, Analysis and/or Report Preparation, and Support. For all the sites excavated by the RLA, Daily Report forms (Figure 2) contained information on excavation levels, features, and sifting, volumes of soil, crew size, and person hours required for various activities. Daily Report forms were also available for the Daniels Island site. Similar field data were gleaned from the Field Supervisor's journal for the Halifax Jail Site and for the Edgewood site. Supplementary data on soil volumes, grid layouts, and excavation procedures were provided by field maps, profile drawings, photographs, etc.

Professionally accepted excavation procedures were employed by the archaeologists on these sites (Figure 3). Any special or "atypical" techniques are described for the appropriate site. Volumes, obtained from profile drawing and field form data were calculated by stratigraphic zones (plow zone, midden, subsoil, etc.) in ft^3, yd^3, and m^3, Shoveling, troweling, sifting (mechanical and manual), and backfilling activities were calculated by volume and by person hours. Mapping, photographing, other recording tasks and miscellaneous activities were calculated by person hours.

Professionally accepted laboratory procedures were employed on all of the projects. These procedures consisted of washing, cataloging, labeling, preliminary sorting, and preparation for curation. Artifact counts were obtained from site catalogs, and a time per artifact rate of processing was calculated for most sites. For six of the eight sites, laboratory records were not as complete as field records. For the Daniels Island and the Halifax Jail sites, all records were complete because of contract obligations. Conservation and restoration activities were recorded for some of the sites. Time and labor involved with analysis, which varied considerably from site to site, are specified in each chapter. The scope and length of the final report for each site also varied. Many were brief field season summaries, while others provided results from extensive analysis and interpretation. Time and personnel involved in these tasks were estimated, except for those projects that required all time categories be recorded. The Overhead/Support category of activities included time spent by one administrative secretary and/or one curator to process of all the necessary paper work for a project. This category was also estimated in most instances. It should be reiterated that this labor position varies in scope and responsibility for each institution or contracting agency. Labor positions are compared in Chapter 10. All person hours for archaeological activities at each site are summarized in tables in each chapter and in Table 1.

After computation of person hours for each task category, a calculation of the costs of the work or products was required. Compilation of this data proved to be a very difficult

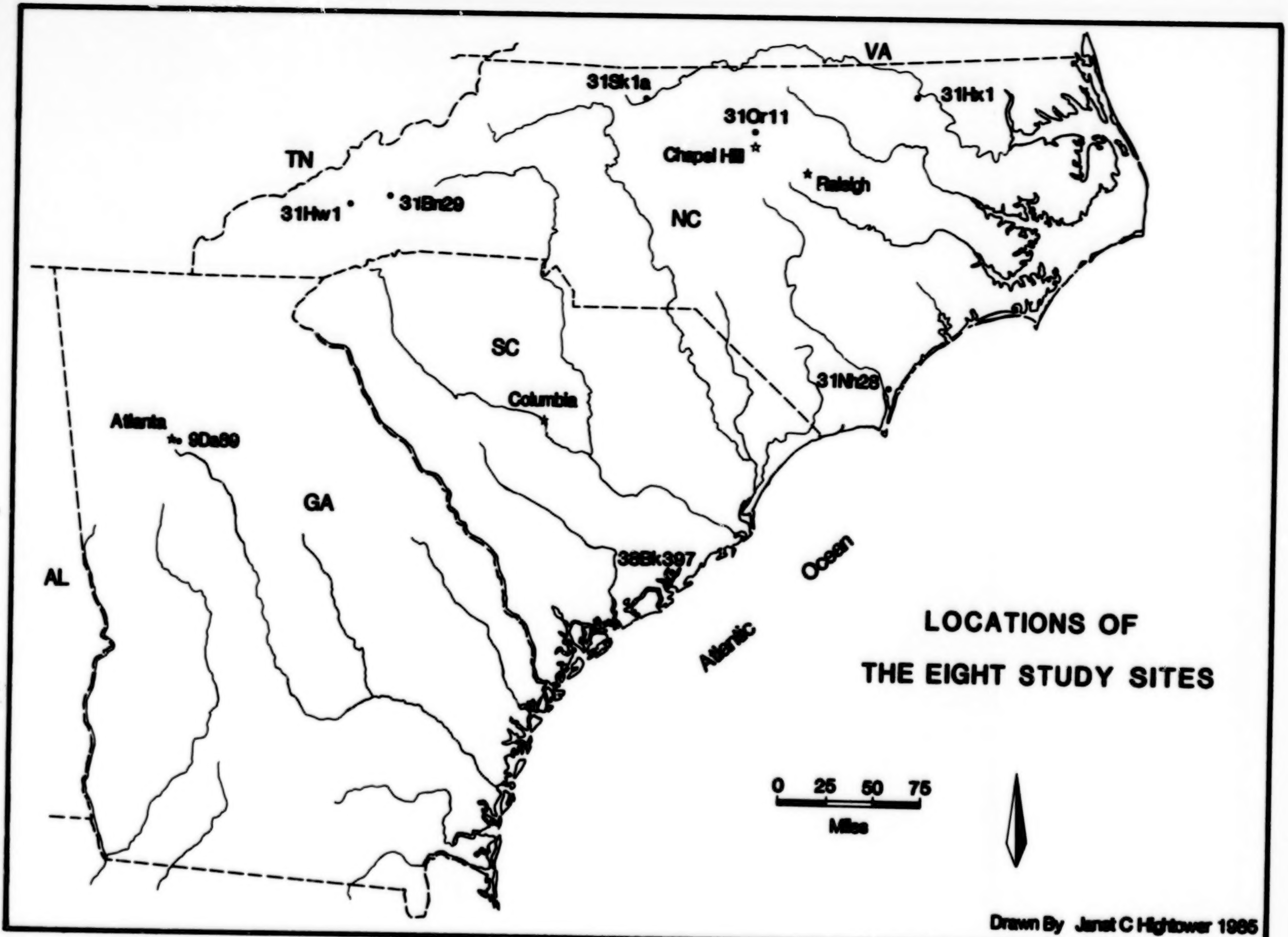
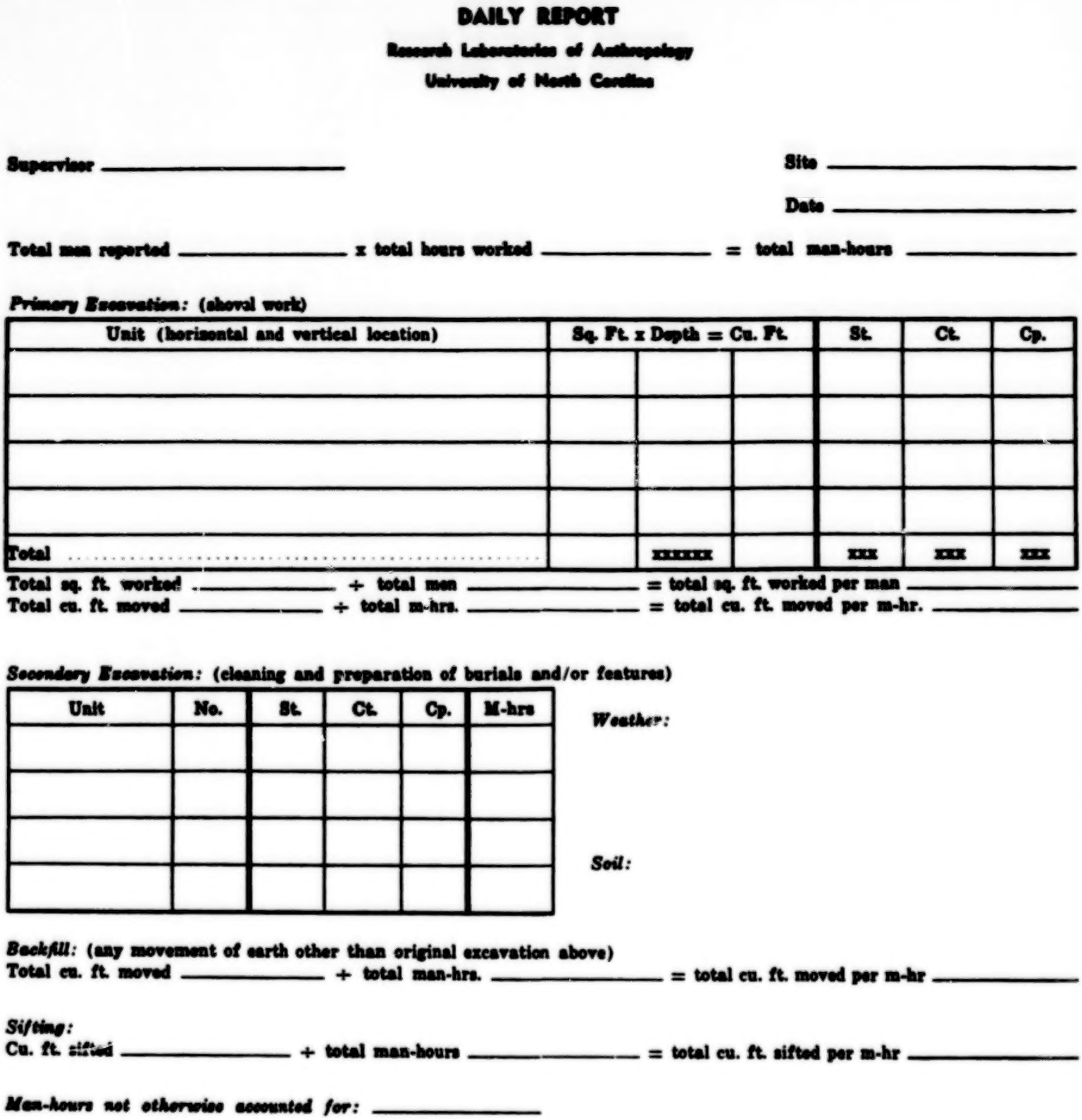


Figure 1. Location of sites.



DAILY REPORT

Research Laboratories of Anthropology

University of North Carolina

Supervisor ______________________ **Site** ______________________

Date ______________________

Total men reported ______________ x **total hours worked** ______________ = **total man-hours** ______________

Primary Excavation: **(shovel work)**

Unit (horizontal and vertical location)	Sq. Ft. x Depth = Cu. Ft.			St.	Ct.	Cp.
Total		xxxxxx		xxx	xxx	xxx

Total sq. ft. worked ______________ ÷ **total men** ______________ = **total sq. ft. worked per man** ______________
Total cu. ft. moved ______________ ÷ **total m-hrs.** ______________ = **total cu. ft. moved per m-hr.** ______________

Secondary Excavation: **(cleaning and preparation of burials and/or features)**

Unit	No.	St.	Ct.	Cp.	M-hrs

Weather:

Soil:

Backfill: **(any movement of earth other than original excavation above)**
Total cu. ft. moved ______________ ÷ **total man-hrs.** ______________ = **total cu. ft. moved per m-hr** ______________

Sifting:
Cu. ft. sifted ______________ ÷ **total man-hours** ______________ = **total cu. ft. sifted per m-hr** ______________

Man-hours not otherwise accounted for: ______________

Figure 2. Example of Daily Report Form.

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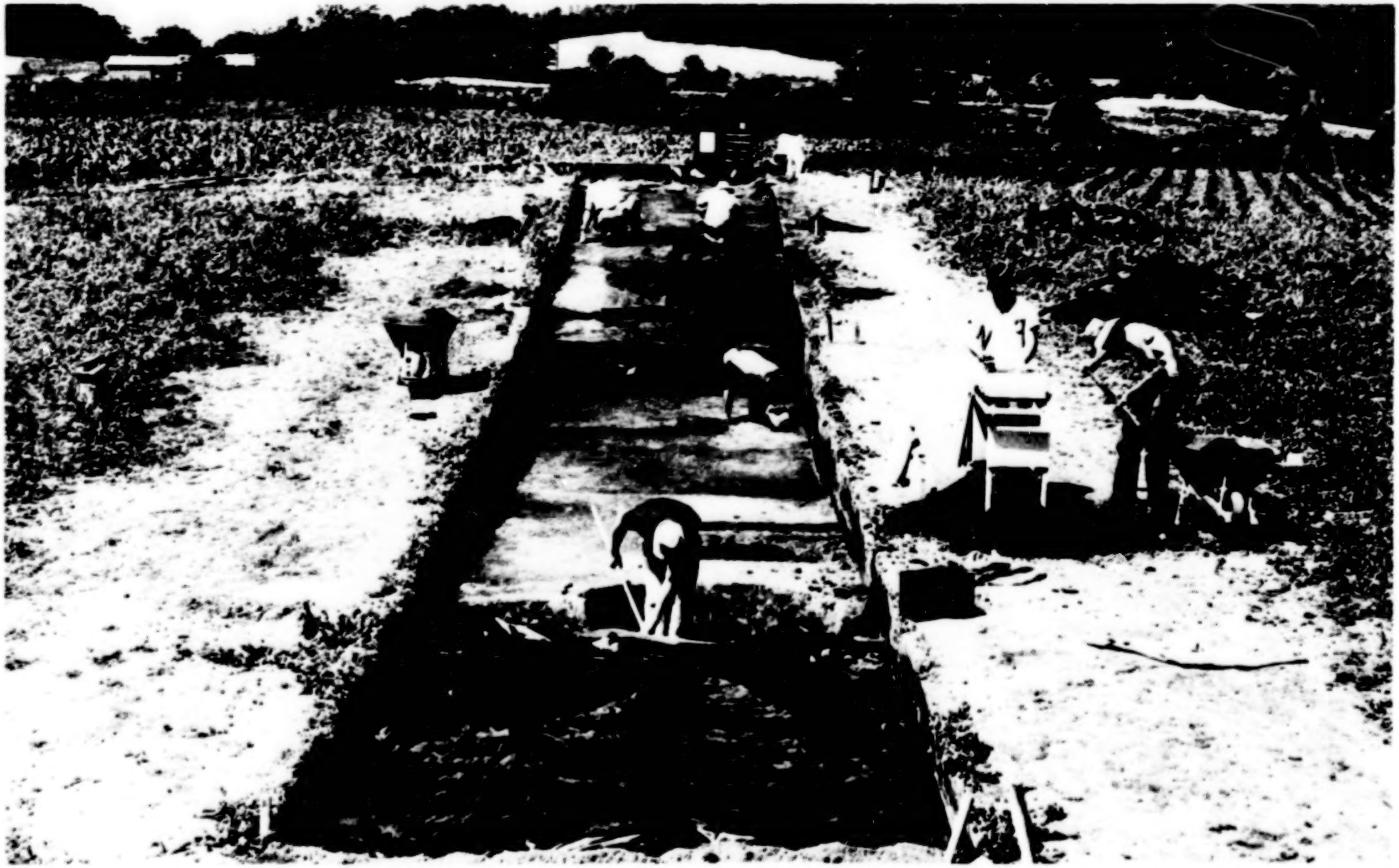

Figure 3. Typical archaeological excavation and recovery procedures.

task for several reasons. Actual invoices for equipment/supply purchases, consulting fees, and laboratory costs, often did not exist or were not available, especially for projects conducted before 1983 (five of the eight sites). Salary information was available for cost of the participating personnel through the various employment and records offices at the relevant universities or agencies. Some salary data was obtained from interviews with site personnel. For the Daniels Island and the Halifax Jail projects, all costs had been retained and itemized. These records were made available for cost assessment analysis by the responsible contracting agency, and are included in this study with their permission. Determining costs for various levels of analysis was difficult in some cases. Primarily, this activity category only included the first phase of analysis, and later phases, (e.g., computerization of data, follow up studies, theses or dissertations, and other specialized analyses) were not included in this cost analysis survey. Publication or duplication requirements for the reports also varied in cost according to the scope and requirements of the project. Attempts were made to standardize the cost categories for all the sites excavated by the RLA.

The tables provide cost data in a format listing "Estimated Cost" and "Projected Cost." The Estimated Cost category is the closest evaluation of actual expenditures that could be obtained from project documents and interviews with personnel. The Projected Cost category includes approximate values of in-kind contributions, particularly volunteer and field school labor. These Projected Costs are as precise as possible but are slightly undervalued.

As a final assessment of costs for archaeological activities, the person hours for each task and the total person hours for each project were compared to the costs per category and the total costs of each project. A "price" per archaeological unit (sizes of units varied for each site) and by ft^3, yd^3 and m^3 were calculated for each site. Also included is a cost per specimen for each site. These figures are provided in each chapter and compared in Chapter 10.

Eight Southeastern archaeological sites were selected to test the data collecting instrument and cost analysis program. Criteria for selection of these sites were: 1) accuracy and availability of management or cost data, 2) extent of published or completed field report, 3) physiographic region, 4) cultural affiliation(s), 5) stratigraphy, and 6) site type. In addition, the excavated area for each site had to consist of a minimum of 1,000 ft^2 or 100 ft^3 with a minimum expenditure of 500 person hours of effort. In a few cases where larger sites involved multiple field seasons, only a single season's field work (and subsequent laboratory work, and summary report) were chosen as a test case. These latter sites were the Wall site (31Or11), Upper Sauratown site (31Sk1a), Warren Wilson site (31Bn29), and Garden Creek Mound site (31Hw1). Six of the sites are located in North Carolina, one in South Carolina, and one in Georgia (Figure 1) A brief summary of the remaining chapters of this report follows, which includes justification for site selection.

Chapter 2 provides an assessment of archaeological activities conducted in 1983 at the Wall site (31Or11) located in Orange County in the Piedmont Physiographic Region of North Carolina. This village site contains components ranging in age from the Late Woodland to Protohistoric period, and has burials, structures, and other features. The 983 excavations at this site were conducted as a teaching field school by the RLA, under the direction of Roy S. Dickens, Jr. Field and laboratory records were available for this archaeological investigation, as were most of the staff and graduate student participants. Analysis and report preparation time and costs were calculated from information provided by the analysts and the principal investigators. A symposium was held at the 1984 Society for Historical Archaeology in which eight analysts presented results of their studies from the 1983 work. This collection of papers was used in lieu of a final site report.

Chapter 3 provides an assessment of archaeological activities conducted during the 1972 season at the site of Upper Sauratown (31Sk1a) located in Stokes County, North Carolina, in the Piedmont Physiographic Region. The site contains the remains of a palisaded village of the early Historic (ca. 1660-1680 A.D.) period. Excavations revealed structures, burials, features, and a palisade. Field work was carried out by the RLA, University of North Carolina, Chapel Hill. Joffre L. Coe was Project Director, and Bennie C. Keel served as Field Director and compiled a detailed final summary report for the 1972 season which provided an assessment of costs and person hours for field work. Time and costs for laboratory work was calculated from information provided by former laboratory personnel (Keith Egloff and Jack Wilson). Analysis time has been added to Keel's field report.

Chapter 4 discusses archaeological activities conducted in 1973 at the Warren Wilson site (31Bn29), located in Buncombe County, North Carolina. This is a large, multicomponent, deeply stratified site. Cultural components included Middle Archaic (ca. 4500 B.C.), to Mississippian (ca. 1300-1500 A.D.). This site has been the focus of intensive archaeological investigations since 1966 and is an important resource for interpreting prehistoric cultural development in the Appalachian Summit Area. Additionally, this site has been well documented in scientific literature (see bibliography for this chapter). The 1973 work was conducted by the RLA under the direction of Joffre L. Coe. Field Archaeologist for this season, Trawick Ward, prepared a summary report which was used to determine total person hours and volume of soil excavated. This field work was also conducted as a teaching field school and included students from Warren Wilson College, University of North Carolina, and Berea College. Some laboratory processing of excavated artifacts took place in the field; final processing was done at the Chapel Hill campus. Estimates of time and costs data for this season's work were provided by Trawick Ward.

Chapter 5 focuses on the 1979 excavations of a Middle Woodland ossuary site located in New Hanover County, North Carolina, in the Coastal Plain physiographic province. The Cold Morning site (31Nh28) was excavated by archaeologists from the RLA, directed by Joffre L. Coe. This archaeological salvage and testing program, funded by the National Park Service, lasted eleven field days. This site was chosen because it represented a rare type of archaeological resource, an ossuary, and because it was a non-field school excavation paid for by a contracting agency. Trawick Ward served as Field Archaeologist and Jack Wilson was Field Assistant. A physical anthropologist, Martha Graham, was paid to supervise processing and analysis of all human skeletal remains. Field, laboratory, and analysis data were derived from extant records or from personal interviews with site personnel. A final site report was prepared by the RLA staff which provided additional information for an assessment of person hours and costs.

Chapter 6 describes the archaeological activities conductor during 1965 at one of the platform mounds (31Hw1) at the Garden Creek site in Haywood County, North Carolina, in the Appalachian Summit Area. This site was was chosen because it represents archaeological investigations of a substructure mound. Work was conducted by the RLA under the direction of Joffre L. Coe. Bennie C. Keel was Field Archaeologist. Although the field work was spread out over six months, only 43 days were involved. This excavation, the first of several seasons of work at this site, was carried out by staff and students of the RLA and several volunteers. Because some aspects of the records were deficient, much of the cost assessment data and person hours had to be estimated. Interviews with site personnel, however, provided most necessary data. A final field work summary report also contained some information on field work and related person hours. Published scientific references for the Garden Creek Mound site (see bibliography for this chapter) provided additional site descriptions and excavation data.

Chapter 7 contains an assessment of archaeological activities conducted at the Daniels Island site (38Bk397), located on the Coastal Plain of Berkeley County, South Carolina. This was the only site excavated by a privately owned cultural resource management firm included in this study. Field work took place from April 27 through June 1, 1984, with Patrick Garrow and Paul Brockington, Co-Principal Investigators. Linda France, assisted by five technicians, served as Field Supervisor. The work was conducted under a contract with the South Carolina Department of Public Highways and Transportation as part of the 1984 Mark Clark Expressway Project. This site represented a rural, domestic farmstead occupied from about 1899 to about 1908. Detailed documentation of field work, laboratory processing, report writing, and expenses, made available by Garrow and Associates, provided accurate data for cost assessment. A final report summarizing archaeological work conducted at this site (and two other sites excavated under the same contract) was prepared by researchers from Garrow and Associates, Inc.

Chapter 8 provides a cost assessment of archaeological activities conducted at the Edgewood site (9Da89), a small early twentieth century, neighborhood garbage deposit located near downtown Atlanta, Georgia. A six week salvage excavation was conducted at this site as part of a cultural resource management contract between the Metropolitan Atlanta Rapid Transit Authority (MARTA) and the Department of Anthropology at Georgia State University (GSU). Roy S. Dickens, Jr. directed the project, and Gary Barber was Field Supervisor. Two 10x10 ft units, excavated to a depth of 4.5 feet, contained complex stratigraphy and dense concentrations of artifacts. Detailed artifact analysis and historical research of this site was undertaken in an undergraduate seminar directed by Dickens. Field data and some cost figures were available for these archaeological activities; whereas information about laboratory processing, analysis time and other expenses had to be estimated.

Chapter 9 details the 1984 excavations at the Third Halifax Jail (31Hx1) located on the Coastal Plain in Halifax, North Carolina. The Jail represents the third historic site included in this study and the only one which involved excavations within a standing structure. It also represents the second non-university project to be assessed. The Jail served the county from 1838 until 1915. Excavations revealed three separate occupation floors and over 57,000 artifacts. Terry Harper, Historic Sites Section of the North Carolina Department of Cultural Resources was Principal Investigator. Linda Carnes, assisted by four field technicians and two laboratory technicians served as Field Supervisor. Accurate records for all aspects of this archaeological project were available, including a final site report, costs, salaries, and person hours.

Chapter 10 offers summary observations and comparisons of the eight sites and the costs of archaeological activities conducted in their investigation. Variations in costs and person hours between sites are evaluated as to physiographic conditions, excavation procedures, paid vs. unpaid labor, and support. For comparative purposes, the final cost figures of each test case were adjusted for inflation (brought up to 1984-85 ranges), overhead variations, and paid vs. non-paid student or volunteer labor in order to provide a realistic value of archaeological expenses. There is a discussion of potential uses of this study and the appropriate applications of its results. The utility of this cost assessment analysis is also discussed in Chapter 10 and offers some suggestions for similar studies in physiographic areas outside of the Southeastern United States.

CHAPTER II

The Wall Site (31Or11)
1983 Season

Excavations at the Wall site (31Or11) were carried out by the RLA. Dr. Roy S. Dickens, Jr., Director, provided overall supervision of the project. Personnel included two other staff archaeologists (Supervisors), five graduate students (Technicians), and 14 to 16 graduate and undergraduate students (Laborers). Most of the field work was conducted as a teaching field school. The field season consisted of 39 days compensating for partial rain days and including setting up and closing down activities at the site.

The site is located in Orange County, North Carolina, within the Piedmont physiographic province. The site is situated in a bend of the Eno River in a large, previously cultivated field and covers approximately 1.5 acres. Soils in the area are sandy or silty loam with clay inclusions. Vegetation on the site consists of tall grasses and weeds, with mature pines and hardwoods lining the immediate river banks. The soils appear well-drained and infrequently flooded.

Culturally, the site dates to the late prehistoric to early protohistoric period (three radiocarbon dates were clustered around 1545 A.D. ±80 years). It lies within 200 yards of another site which dates to 1680-1720 A.D. and is the putative town of Occaneechi visited by John Lawson in 1701. Both village settlements, although separated by about two centuries, probably were occupied by small tribes of Siouan speaking Indians, who are historically documented in the Eastern Piedmont region of North Carolina.

The Wall site was first investigated by Joffre Coe in 1938-1941. Maps of Coe's excavations show circular house patterns, burials, large shallow pits, and palisade lines. During excavations at the site in 1983, additional burials, pits, post hole lines, and dense midden zones were exposed. The 1983 excavation, together with work at the neighboring site of 31Or231, initiated a five-year research project on the archaeology of the Eastern Siouan tribes of the Carolina Piedmont.

Analysis of Tasks by Person Hours

Planning

The planning phase of the 1983 project included time involved in the creation of a research design, contract negotiations, budget planning, background research for the site, and personnel and student selection. It also included time spent gathering necessary materials for construction of some field equipment, obtaining general field supplies, and preparing the site (building a storage shed, etc.). This category of activity required the efforts of three staff supervisors and two graduate student technicians. A total of 445.0 person hours is a conservative estimate of these activities (Table 2).

Table 2. Summary of Person Hours by Tasks for the Wall Site (31Or11), 1983 Season.

Activity	Task*	Person Hours	
Planning	Research Design Preparation	285.0	
	Preparation and Construction of Field Equipment	160.0	445.0
Field Work**	Primary Excavation	1014.5	
	Secondary Excavation	316.5	
	Screening		
	Sifting	188.0	
	Water screening	840.0	
	Mapping, Cleaning, Photography	101.0	
	Travel	470.0	
	Backfilling (Supervising)	8.0	
	Miscellaneous	55.0	2993.0
Laboratory Work	Washing	298.1	
	Cataloging	204.0	
	Labelling	75.0	
	Supervising	22.5	599.6
Final Report	Research Analysis	1127.8	
	Report Preparation	471.5	1599.3
Overhead/Support			480.0
Total Person Hours for Project			6116.9

* See text for descriptions of tasks.
** Supervision included in Primary and Secondary Excavation. See text for explanation.

Field Work

A total of 2993.0 person hours was required to complete excavation of 18 10x10 ft archaeological units at the site (Figure 4). In the field, these person hours were recorded on Daily Report forms (see attached example), which include information on excavated levels, features, and sifting, and time required for each activity. "Primary excavation" consisted of all dirt removed by natural zones or arbitrary levels using shovels and trowels. Post hole excavation was included in this estimate, as the person hour information for the 45 excavated post holes was not recorded separately from the person

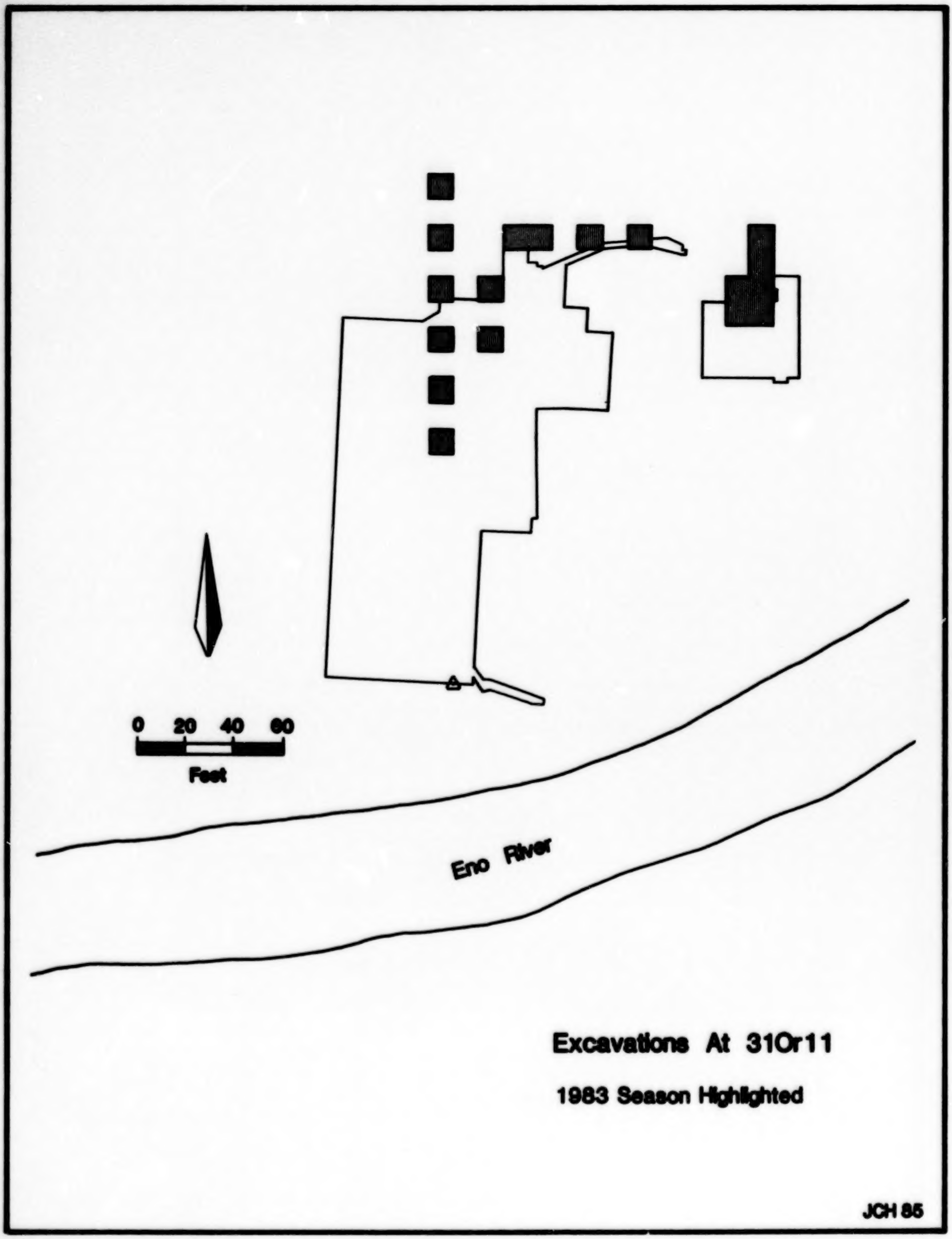

Figure 4. Map of 1983 excavations at the Wall site (31Or11).

hours for each level and zone of excavation. Person hours for "Secondary excavation" were compiled by combining time spent excavating the three burials at the site. Burials were excavated using trowels, grapefruit knives, dental picks, and brushes. No other features were encountered at the site in 1983.

Standard field procedures for completing a unit were as follows:

a) Plow zone was removed with shovels. Soil at the interface of plow zone and subsoil was excavated using trowels. Plow zone soil was sifted from 11 of the 18 units because seven units contained previously disturbed (sifted) soils from Coe's 1938-1941 field work. Zone 1 (plow zone) and post hole soil was dry-screened using ½-inch wire mesh.

b) A midden zone was encountered beneath the plow zone in four units, for a total of 249.62 ft^3 (9.24 yd^3; 7.06 m^3). The midden (Zone 2) was hand excavated using trowels and other small tools and included under the Primary excavation category. Because of the dense nature of the midden zone, excavation time required to complete the task was somewhat longer than average. During excavation, midden soil was treated as "feature" soil and was water-screened in a sluice box through graduated screen sizes of 1/16-, ¼-, and ½-inch wire mesh.

c) After plow zone and midden (if present) were removed, features (burials and post holes) were exposed at contact with the subsoil. All features were mapped (1 in=1 ft; 1:12 scale) and photographed (black and white and color). Flotation samples were systematically obtained for midden zones. They averaged 10 liters per sample, but no records were kept as to their number. All burial fill soils were processed using flotation. Burials were excavated as previously described for features.

Person hours expended in water-screening were not precisely recorded. It is estimated that four people water-screened for 7.0 hours per day for 30 days (840.0 person hours). There were two sluices in constant operation excluding very brief times for refueling and maintenance.

Miscellaneous activities included laying out the grid, mapping, transit work, photographing, grass cutting, and instructors' lecture time. "Travel time" to and from the site each day and any additional special trips for supplies, materials, etc. (some of these were not reported) were also counted as a separate category. In areas where the daily report sheets were lacking in information, students' daily field journals were examined and/or interviews with field personnel were conducted. Also, photographic data forms or profile and feature maps were examined in order to recreate daily activities on the sites. On the average, three people per unit (two digging and one screening, or two screening and one digging) could complete primary excavation of a 10x10 ft unit in 2 days, or 48.0 person hours (the actual range was 24.0-48.0 person hours). Soil conditions and the number of features encountered below the plow zone increased or decreased this time. Experienced personnel (supervisors and technicians) versus inexperienced personnel (field school students or volunteers) also affected the time required to excavate one unit. Person hours directly related to supervisory tasks could not be differentiated from other field categories because of on-going training activities with the field school students. Supervisors' time was included in the overall field summary.

A "typical" excavation unit was a 10x10 ft square and contained two levels:

1) plow zone, ranging from 0.52 to 1.24 ft thick;

2) disturbed subsoil (plow scarred) ranging from 0.12 to 0.63 ft thick.

Four units contained a midden zone between the plowed soil and subsoil. This zone varied in thickness from 0.26 to 0.9 ft.

Excluding burials, an average unit contained 114.80 ft^3 (4.20 yd^3; 3.21 m^3) of soil, which for the 18 units excavated totaled 2,067.00 ft^3 (75.65 yd^3; 57.87 m^3). Time required for primary excavation was 1,014.5 person hours (0.5 hour per ft^3, 13.4 hours per yd^3; 17.5 person hours per m^3).

Three burials were uncovered during the 1983 season. The excavated volume of the graves collectively, totalled 101.30 ft^3 (3.75 yd^3; 2.40 m^3) of soil and required 300.0 person hours to complete. The dimensions of the burial pits were:

Burial 1) 4.5 ft long by 3.0 ft wide and 4.2 ft deep.

Burial 2) 3.3 ft long by 2.9 ft wide and 2.4 ft deep.

Burial 3) 4.9 ft long by 2.7 ft wide and 1.6 ft deep.

Only 45 of the exposed post holes were excavated. Time for this work was included in "Primary Excavation". Backfilling of the excavations was done mechanically, and required one supervisor for 1 day (8.0 person hours).

Laboratory Work

Laboratory processing of the artifacts required 599.6 person hours to complete. The activities involved during this processing consisted of washing, cataloging, labeling, preliminary sorting, and preparation for curation/storage. These activities required one staff supervisor. The Director also made frequent unrecorded visits to the laboratory to examine and comment on the work.

A total of 23,571 artifacts and bags of material for flotation were processed during laboratory activities. The range of artifacts per unit was 2,990 (maximum) to 14 (minimum), with a mean of 1,309.5 artifacts per unit (11.4 artifacts per ft^3; 308 per yd^3; 405 per m^3). This provided a processing rate of 39.1 artifacts per person hour.

Final Report

Once the artifacts had been processed, they were sorted into final categories for analysis. These categories included human skeletal remains, faunal materials, ethnobotanical materials, ceramics, lithics, shell artifacts, and "historic" (European) artifacts. Interviews with various analysts provided a summary of analysis time required for each category. Other non-artifact categories analyzed were mortuary practices, inter-site settlement patterning, and intra-site settlement patterning, plus historical or archival research for all aspects of the site. Final preparation of the report also included time for map and chart drafting, darkroom work for photographic plates, writing, typing, editing and compilation.

The distribution of person hours in preparing the final report are tabulated in Table 3. In summary, analysis, research and report preparation required 1,599.3 person hours.

Table 3. Distribution of Person Hours for Final Report Preparation for the Wall site (31OR11), 1983 Season.

Category	Research and Analysis	Writing and editing
Human Skeletal Remains	250.0	70.0
Faunal Remains	235.0	20.0
Settlement Patterning	36.0	36.0
Intrasite Patterning	62.5	62.5
Ceramics	40.0	40.0
Mortuary Practices	30.0	40.0
Historic Trade Goods	105.0	40.0
Floral Remains	160.0	40.0
Lithics	109.3	40.0
Shell Artifacts	100.0	40.0
Totals	1127.8	428.5

Support/Overhead

One administrative secretary was required to process all of the necessary data (organizing and typing employment forms, payroll, invoices, supply orders, and final photographic data forms).

Cost of Archaeological Activities

The following information regarding costs incurred during archaeological activities at 31Or11 is based on actual invoices, salary reports, receipts for supplies, or reasonable estimates. Activity categories include Equipment and Supplies (required for field and lab activities), Transportation costs for four field vehicles, Storage facilities both on campus and off-campus (permanent), Labor costs for field work, laboratory work, analysis, and report preparation, Publication costs, Special Services (including C^{14} dating and mechanical backfilling of the site), and Overhead/Support costs for secretarial and administrative duties. A summary of this information is presented in Table 4, which provides Estimated Costs and Projected Costs for each Activity category.

Table 4. Summary of Cost by Activity for The Wall Site (31Or11), 1983 Season.

Activity	Estimated Costs ($)		Projected Costs ($)	
Equipment and Supplies				
Expendables	740.00		740.00	
Equipment	2404.00		2404.00	
		3144.00		3144.00
Transportation		480.00		480.00
Storage				
Laboratory Storage	144.00		144.00	
Permanent Storage (First Year)	40.00		40.00	
		184.00		184.00
Labor				
Field	***19578.00		33517.20	
Laboratory	1999.33		1999.33	
Analysis	5529.28		5529.28	
Report Preparation	4798.00		4798.00	
		31904.61		45843.81
Publication				
Final Report	510.52		510.52	
Duplication**	400.00		400.00	
		910.52		910.52
Special Services				
C^{14} Dating	525.00		525.00	
Mechanical Backfilling	300.00		300.00	
		825.00		825.00
Overhead/Support		3696.00		3696.00
Total Costs		41144.13		55083.33

* 3 Supervisors, 5 technicians and 15 laborers.
** 20 copies at $20 copy.
*** Excludes unpaid student labor.

Equipment and Supplies

This cost category was subdivided into expendables and equipment. Expendables included such items as bags, string, plastic bags, sheet plastic, file, gasoline, oil, and nails. Equipment included construction materials for sifters, sluices, shed, and storage racks. Maintenance and repair costs were also incorporated into this category. Some new equipment was also purchased (e.g., a pump, a transit, letters for sign board).

Transportation

This category consisted of the costs for four vehicles, at \$.20 per mile for 22 miles (round trip) for 39 field days. Gasoline was included in the expendable supply category.

Storage

This category included on campus storage at a cost of \$144.00 during the laboratory processing of artifacts from the 1983 excavations. The collection comprised 48.0 ft^3 when consolidated for curation and storage. Permanent storage at a university warehouse costs \$184.00 (\$3.84 per ft^3).

Labor

Labor accounted for the highest costs for the 1983 work at 31Or11. Teaching activities associated with the field school required more supervisors and reflected one reason for an increase in labor cost. Field labor included three staff supervisors at an average rate of \$12.80 per hour and five student technicians at an hourly rate of \$4.95 and required 2,993.0 person hours to complete. Unsalaried students enrolled in the field school were counted in person hours of labor and were entered in Table 4 as Projected Cost (15 students at minimum wage of \$3.63 per hour for 32 days at 8 hours per day). Field work totaled \$33,517.20, including \$19,578.00 of actual cost plus \$13,939.20 of student labor.

Laboratory labor included six lab technicians at an hourly rate of \$3.23 for 577.1 person hours and one staff supervisor at \$8.60 per hour for 22.5 person hours. The total cost of labor for laboratory processing was \$1,999.33.

The cost for labor during analysis was \$5,529.28, which included the wages of ten people averaging \$3.71 per hour. Report preparation, which included writing up analyzed materials, preparation for charts, tables, editing, etc. for each of the ten analysts cost an additional \$4,798.00.

Publication

The cost to complete the original final report, including photographic plates, inked drawings, and typed text came to \$510.52, estimating a page total of 150 and 20-25 prints and drawings. The cost of duplication of one copy was obtained from the university print shop and came to \$20.00. A Projected Cost of \$400.00 is shown in Table 2, which represents 20 copies (typically the minimum number of copies required to fulfill contract agreements) at \$20.00 per copy.

Special Services

Three radiocarbon samples were analyzed from the 1983 excavation at a cost of \$175.00 per sample. A mechanical front end loader and operator for backfilling the excavation cost \$300.00.

Support

This cost category was obtained by estimating the time involved for one administrative secretary to perform those duties related to the 1983 research of 31Or11. An estimated 480.0 hours were required. At $7.70 per hour and support costs amounted to $3,696.00.

Summary

A total of 6116.9 person hours was required to complete the 1983 archaeological investigations at 31Or11. By combining the Estimated and Projected Costs, a total of $55,083.33 was required to to complete the archaeological activities conducted at 131Or11 in 1983. As a final approach to the assessment of archaeological activities at the Wall site, person hours and total costs are compared. The total cost of $55,083.33 divided by the total number of units completed (18) during the field season produces a value of $ 3,060.18 per archaeological unit ($25.07 per ft^3; $677.03 per yd^3; $895.52 per m^3). Viewed from a specimen perspective each cataloged object or sample cost $2.30 to collect, document, process, report and curate.

CHAPTER III

Upper Sauratown Site (31Sk1a)
1972 Season

This report presents an assessment of archaeological activities conducted at the site of Upper Sauratown (31Sk1a) by the Research Laboratories of Anthropology (RLA) at the University of North Carolina, Chapel Hill. Only the data generated by the 1972 excavations were examined. This site was selected because information on actual cost and person hours of field work was readily available in a summary field report (Keel 1972) and it represented a protohistoric site type on the Piedmont Province as required by the contract. Unrecorded information on costs and person hours required for laboratory processing and report preparation was obtained through interviews with former site staff and the Administrative Secretary.

Dr. Joffre L. Coe, then Director of RLA, provided overall supervision of the project. Dr. Bennie C. Keel served as Field Archaeologist, and Keith T. Egloff was Field Assistant. Other site personnel included eleven graduate and undergraduate students who were paid. Field work was conducted from June 6 to August 25, 1972. Artifact processing, partial data analysis, and preparation of a final report was conducted by RLA staff and students.

The site of Upper Sauratown (31Sk1a) lies within the Piedmont physiographic province in Stokes County, North Carolina, on the Dan River. The 1 acre site is in the southeast corner of a large cultivated field, and is bounded on the east by the Dan River and on the south by an old road bed. Archaeological remains are found along the top of a natural levee, 12 to 15 ft above normal river level (Figure 5).

Prior to 1972, vandalism by local relic collectors had extensively damaged this site and a neighboring site. Following a visit to the site in January 1972, plans were made for an archaeological project to recover information from damaged areas of the site. After permission was obtained from the property owner and local tenant, excavations began on June 6. Artifacts from private collections and archaeological materials recovered during the first summer's excavation by the RLA suggested a cultural period of A.D. 1650s to 1680s. Archaic period specimens were also recovered at the contact between midden and clay subsoil.

Prehistoric and historic occupations were observed in three soil layers:

1) Plow zone was approximately 1.0 ft thick and composed of fine clay loam. It was dark grey-brown in color. Prior to cultivation this layer represented at least a portion of the midden that accumulated during the aboriginal period.

2) Midden was described as a fine-grained soil, dark grey to black in color. It contained undisturbed deposits of cultural materials. Numerous pits, features, and burials originated in this zone.

3) Subsoil was encountered beneath the midden at a depth of 1.5 to 2.0 ft below surface. It was composed of a light yellow-orange clay. A thin layer of small cobbles and pebbles was observed in the wall of Feature 24 at a depth of 4.0 ft below surface.

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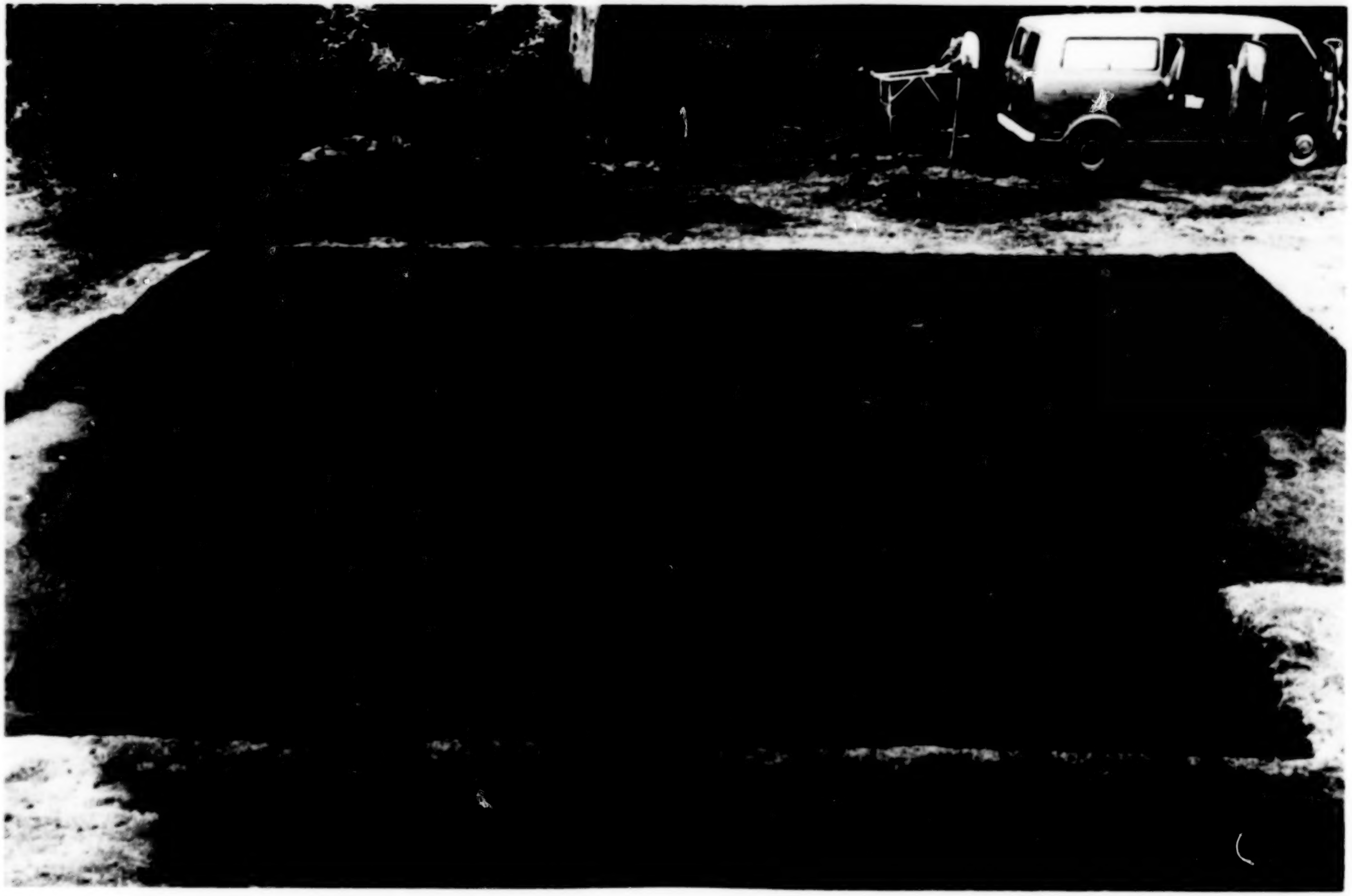

Figure 5. Circular house post pattern and associated features and burials at the Upper Sauratown site (31Sk1a).

Analysis of Tasks by Person Hours

Planning

The planning phase of the 1972 excavations at 31Sk1a included those hours devoted to Logistics and Operations, which totaled 614.0 person hours (Table 5). Logistics included hours spent setting up a field camp, constructing a shed on the site, and erecting a second site camp after the first one was flooded. Operations included laying out the site grid and surveying work. When field work was interrupted by extensive rains, the crew spent time washing artifacts and other related project tasks, e.g., checking bag numbers, completing and checking field records, and developing film. This time was also included in the Operations category.

Table 5. Summary of Person Hours by Tasks for Upper Sauratown Site (31Sk1a), 1972 Season.

Activity	Task*	Person Hours	
Planning	Logistics/Operations		614.0
Field Work	Field Supervision	532.0	
	Primary Excavation	487.0	
	Secondary Excavation		
	Burials (N = 24)	772.0	
	Features (N = 31)	341.0	
	Post holes (N = 1104)	314.0	
	Screening		
	Sifting	390.0	
	Water-screening	162.0	
	Back Filling	197.0	
	Miscellaneous (Rain, etc.)	31.5	
			3226.5
Laboratory Work	Washing, Cataloging and Labeling	2250.0	
	Supervising	540.0	
	Processing Burials (N = 24)	960.0	
			3750.0
Final Report	Preparation of maps, drawings, and photographs	65.0	
	Report Preparation	80.0	
			145.0
Overhead/Support			480.0
Total Person Hours for Project			8215.5

* See text for description of tasks.

Field Work

Excavations were begun on June 6 and were terminated on August 25. A grid was laid out, and two areas that were relatively undisturbed by collectors' activities were selected for initial investigation (Figure 6). Two test trenches were also excavated between the two main areas. Field work time totaled 2,694.5 person hours and was divided into the following categories:

a) Primary excavation, which totaled 487.0 person hours, included plow zone removal by shovel, troweling the interface layer between plow zone and midden, midden removal, troweling subsoil surface, and initial mapping of all exposed features. A total of 32 10x10 ft units were excavated by shoveling and troweling. The average thickness of the deposits excavated was 1.1 ft, yielding approximately 127 yd^3 (97.15 m^3) of soil. Shovel work totaled 487.0 hours (averaging 15.2 person hours per unit).

b) Secondary excavation, which required 1427.0 hours to complete, included time spent excavating 1104 post holes, 31 features, 24 burials, and other special finds. Trowels, grapefruit knives, brushes and other small tools were used to complete these tasks. Because of the excellent field records kept during the 1972 excavations, a detailed table is provided in Appendix II of this report which shows the time (person hours) and cost (monies) to excavate each burial and feature. The average time for burial excavation was 32.1 person hours (based on a sample size of 24). As shown in Appendix I, some burials required more time to complete than others. Features were subdivided into two main types: deep storage pits, which averaged 20.2 hours to dig; and large, shallow pits, which averaged 23.0 hours to complete. The average grave had a volume of 25.00 ft^3 (0.93 yd^3; 0.71 m^3). The avegage deep storage pit had a volume of 24.70 ft^3 (0.91 yd^3; 0.69 m^3) The average time spent for post hole excavation was 17 minutes or 0.3 person hour.

c) All non-feature soil was sifted through ½-inch wire mesh using a mechanical sifting machine. This required 390.0 hours (averaging 12.3 person hours per unit). Water screening the soils excavated from all features and burials was done by using a 1/16-inch wire screen and required 162.0 person hours to complete. No provenience information was available for the water-screened material.

d) Backfilling of the excavations required 197.0 person hours.

e) Miscellaneous person hours included 20.0 hours lost for rain delays and 11.5 hours spent doing other unrecorded project tasks. Keel's time (440.0 hours) was included in Logistics/Operation, and 174.0 hours of K. Egloff's time were allotted to the same categories with the remaining 266.0 hours of his time allotted to field work. 266.0 hours of Keel's time was included as field supervisor.

Laboratory Work

Laboratory records for processing materials for 31Sk1a do not exist. Fortunately, the laboratory supervisor for the project was available for consultation. He estimated that laboratory processing (a combination of washing, labeling and cataloging) lasted 18 weeks. Labor for laboratory processing consisted of one graduate student, and four

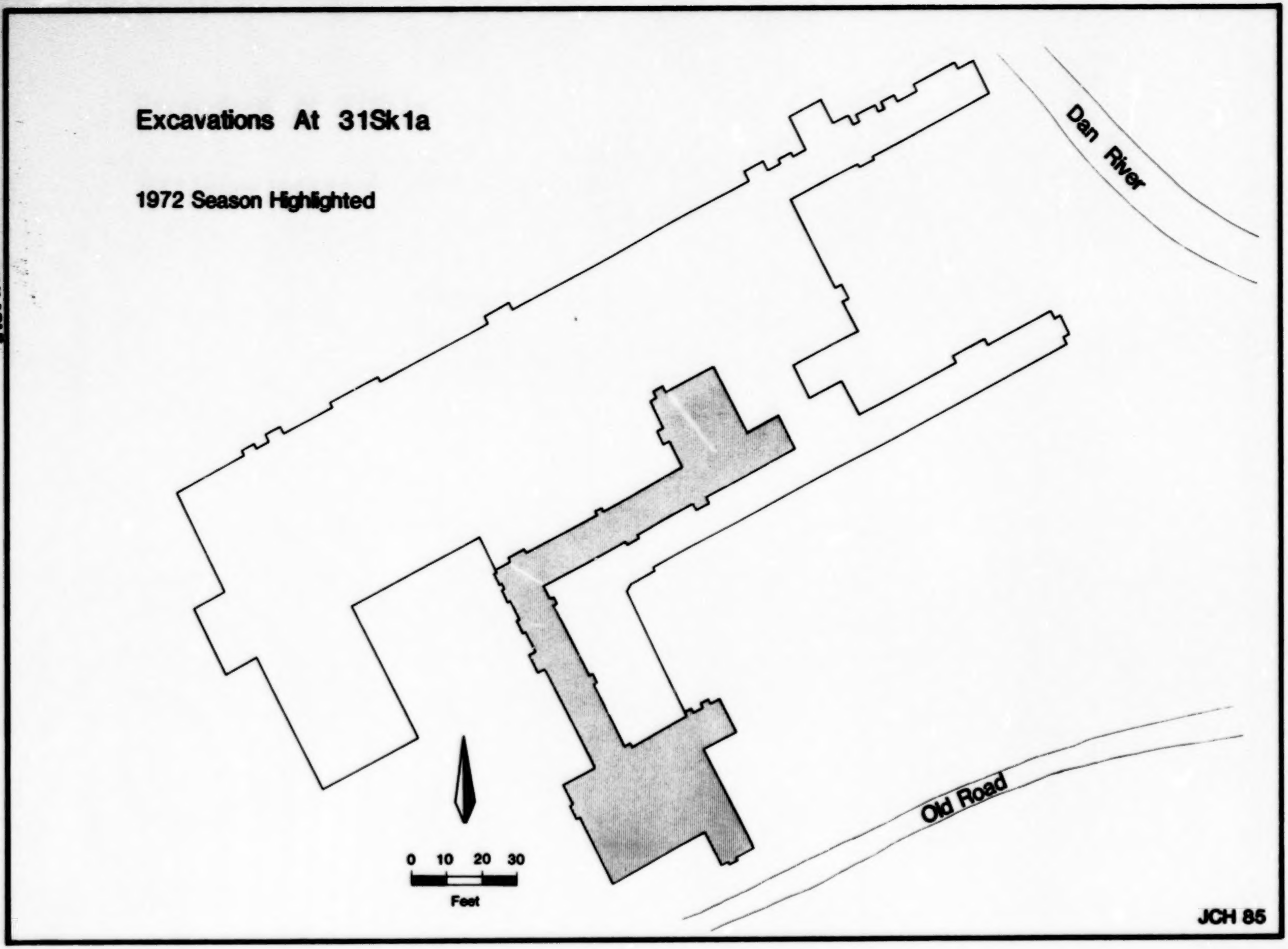

Figure 6. Map of 1972 excavations at the Upper Sauratown site (31Sk1a).

undergraduate students. Each worked for approximately 450.0 hours on the project for a total of 2,250.0 person hours. The laboratory supervisor spent approximately 540.0 hours, or 75% of his time, supervising the processing of material from the site. Analysis of artifacts was only partly completed because of a lack of funding. An additional experienced person processed the 24 burials, for a total of 960.0 hours.

A total of 52,940 specimens was processed during the laboratory phase of the project. The ranges of specimens recovered were 0 to 2,994 per unit, 3 to 1,576 per feature, and 17 to 295 per burial. The mean specimen count per unit was 1,320.2. The average specimen count per burials was 108.8, and features such as deep storage pits had an average of 157.4 specimens. A processing rate of 14.1 artifacts per person hour is calculated for this project.

Final Report

Data from field and laboratory work was tabulated and interpreted upon the completion of the laboratory processes previously outlined. Those activities took approximately 80.0 person hours. The report was illustrated with six cartographic figures which required 45.0 person hours to complete. Photographic activities took approximately 20.0 hours from initial conception through the "paste up" of the two photographic plates. The total time required for tabulation, report writing, and preparation is estimated at 145.0 person hours.

Support

One administrative secretary was required to process all of the necessary data forms and other records of the project. The tasks included organizing and typing various purchasing and employment forms, and final photographic and cataloging forms. Because no records exist for person hours spent by the secretary for this project, an estimate was obtained through comparison of the time spent completing data from 31Or11. The estimate totaled 480.0 person hours for these tasks.

Cost of Archaeological Activities

The following information on cost of archaeological activities for the 1972 season at 31Sk1a is based on Keel's (1972) field report, interviews with the former site field assistant and laboratory supervisor, and other site personnel, salary reports, and reasonable estimates. As outlined in Table 6, the activity categories include Equipment and Supplies, Transportation, Housing, Storage, Labor, Publication, and Overhead/Support. Cost figures were divided into Estimated Costs where the pertinent information was available, and Projected Costs where the cost was based on a reasonable estimate of current needs for a project of this magnitude deflated for a 12-year difference.

Table 6. Summary of Cost by Activity, Upper Sauratown Site (31Sk1a), 1972 Season.

Activity	Estimated Costs ($)		Projected Costs ($)	
Equipment and Supplies				
Expendables	500.00		500.00	
Equipment	500.00		500.00	
		1000.00		1000.00
Transportation				
Two vehicles (3 months)		132.00		132.00
Housing:				
Rent (3 months)	300.00		300.00	
Per diem	400.00		400.00	
		700.00		700.00
Storage				
Temporary Laboratory Storage	144.00		144.00	
Permanent Storage per year	40.00		40.00	
		184.00		184.00
Labor				
Planning	3514.00		3514.00	
Field	7349.12		7329.12	
Laboratory				
Processing Artifacts	1332.00		2790.00	
Processing Human Skeletal Remains	1728.00		1728.00	
Supervising of Processing	1620.00		1620.00	
Report Preparation				
Cartography/Drawings	79.20		79.20	
Photography	136.00		136.00	
Writing/Compilation	544.00		544.00	
		16302.32		17760.32
Publication				
Final Report	120.00		120.00	
Duplication (20 @ $2.00 per copy)	40.00		40.00	
		160.00		160.00
Overhead/Support		2640.00		2640.00
Total Costs		21118.32		22576.32

Equipment and Supplies

This category was estimated as to cost because no actual invoices or receipts were available. This category consisted of Expendables, which included such items as bags, sheet plastic, nails, string, film, oil, gasoline, and plastic bags; and Equipment, which included mechanical sifter, shed, tool box, storage racks, and all field equipment. Maintenance and repair costs also were incorporated into this category. A liberal estimate of $1,000.00 was required for the equipment and expendables used in the 1972 investigations.

Transportation

Transportation costs are also estimated from known facts. The total is $132.00. Two field vehicles were required to drive the 11-mile round trip to and from the site for 12 weeks (60 days) of field work. An estimate of $.10 per mile per vehicle was applied. Gasoline was included in the Expendable Supplies category and not in Transportation.

Housing

The field house provided by the RLA was located in the town of Walnut Cove, rented for $100.00 per month. Rent was paid for the 3-month field season. The utilities were paid by the the Field Archaeologist who received $400.00 in per diem for the season.

Storage

This category included on campus storage during laboratory processing of artifacts and burial remains from the 1972 excavations. The same university rates were applied to the space required for laboratory processing as quoted for 31Or11. This is assuming a minimal cost fluctuation for university storage space for the 12-year interval. Permanent storage at a university warehouse was figured at $.40 per ft^2 ($2.53 per ft^3). This was calculated to be $40.00 per year for permanent storage of the collection.

Labor

Labor costs accounted for the largest dollar amount of any of the categories for the 1972 archaeological work at 31Sk1a. Actual costs for the Planning and Field Work categories were obtained from Keel's (1972) field report. Labor costs for the Laboratory and Report Preparation categories had to be estimated. The Field costs were calculated at an hourly rate of $1.76 per person (technicians and laborers). Planning costs totaled $3,514.00 reflecting 614.0 person hours (supervisor: 440.0 hours at $6.80 per hour=$2,992.00; plus assistant: 174.0 hours at $3.00 per hour=$522.70). Field costs were estimated at a total of $7,349.12, with a cost of $798.00 for the field assistant (266.0 hours at $3.00 per hour), $1,808.80 for the field director (266.0 hours at $6.80 per hour), and $4,742.32 for the technicians (2,694.5 hours at $1.76 per hour). All field workers were paid by the hour and volunteer time was not calculated.

Seven people were involved in the processing of materials recovered 31Sk1a. Two of the workers were unpaid volunteers. Two other employees were hired through the work study program and were thus paid through a separate university fund. The single paid graduate technician earned $1.76 per hour. All technicians worked and average of 25.0 hours per week for 18 weeks (450.0 hours each). The paid technician earned $792.00. The Projected Cost of all laboratory technicians would have been $2,250.00. The laboratory supervisor was paid at a rate of $3.00 for 180.0 hours of processing for a total of $540.00. The person processing the human skeletal material was paid $1.80 per hour for 960 hours of work. Thus, the processing of the remains of 24 individuals was $1,728.00.

In addition, the laboratory supervisor Keith Egloff earned approximately $1,620.00 for 540.0 hours of supervision of laboratory processing. In summary, laboratory processing cost a total of $4,680.00.

Publication

Completion of the report is estimated to have cost $757.20. Cartographic work was accomplished in 45.0 hours at a rate of $1.76 per hour. It is estimated that the darkroom labor for the project cost $6.80 per hour for 20.0 hours. The project supervisor is estimated to have spent 80.0 hours at $6.80 per hour compiling and writing the field report.

Typing of the report cost the RLA approximately $120.00 for the original copy. Duplication costs, estimated at $.05 per page, totaled $2.00 per copy, or $40.00 for 20 copies. The final report consisted of six cartographic figures, two tables, two photographic plates, and 38 pages of text.

Support

This Estimated Cost was obtained from an interview with the RLA's Administrative Secretary during the 1972 archaeological investigation of 31Sk1a. She estimated 480.0 hours were required, at $5.50 per hour for a total of $2,640.00.

Summary

A total of 8,215.5 person hours was required to complete the 1972 archaeological investigations at 31Sk1a. A conservative cost estimate based on field notes, daily reports and interviews with former staff who worked on the project for the excavation, recording, specimen processing, analysis, curation and reporting is $21,118.32. When this cost is divided by the volume of soil excavated it is estimated that the archaeological work on the average costs $4.34 per ft^3 ($117.18 per yd^3; $155.00 per m^3). If the value ($2,250.00) of volunteer labor and work study student efforts is included the total cost rises to $22,576.32, which provides a cost of $4.64 per ft^3 ($125.27 per yd^3; $167.70 per m^3). In terms of specimens recovered and costs on the average, each specimen cost a maximum of $0.40 to recover, process, analyze, curate and report, and a Projected Cost of $0.43 per specimen.

CHAPTER IV

The Warren Wilson Site (31Bn29)

1973 Season

The 1973 field season at the Warren Wilson site (31Bn29) was selected as it represents a prehistoric stratified site in the Mountain physiographic province. Archaeological investigations at this site are well documented in the scientific literature (Corkran 1975; Dickens 1970, 1976; Keel 1976; Moore 1981; Runquist 1979; Sanford 1970; Simpkins 1984, Ward 1973, 1980; Wing 1970; Yarnell 1970). Specific information related to the field work, laboratory processing, reports preparation and personnel involved in the 1973 season's work was readily available.

The 1973 excavations at this site were supervised by Joffre L. Coe, Director, RLA. Trawick Ward served as Field Archaeologist and Jeanette Runquist was Field Assistant. Most of the 1973 field work was carried out as a teaching field school in two consecutive five week terms. Nine students participated in the first term, and six students were enrolled in the second term. The class consisted of graduate and undergraduate students from the University of North Carolina at Chapel Hill, Warren Wilson College (Swannanoa, NC), and Berea College (Berea, Kentucky). The crew size averaged from seven to eight people per school term. The field season lasted 59 days. Laboratory processing in the field consisted of washing and preliminary sorting of artifacts. Final artifact processing and preparation of the field work summary report (Ward 1973) was done by RLA staff and students at UNC - Chapel Hill.

The Warren Wilson site is a large, multicomponent, deeply stratified site (Figure 7). Cultural components range in age from the Middle Archaic (ca. 4500 B.C.) to Late Woodland - Mississippian (ca. 1300 to 1500 A.D.). It is located in Buncombe County, North Carolina, within the Appalachian Summit region of the Blue Ridge physiographic province. The site, situated on an alluvial terrace of the Swannanoa River, covers approximately 2.5 acres. In describing the stratigraphy, Dickens (1976: 19,25) states:

> A typical stratigraphic profile at the site exposed, from top to bottom, the following cultural zones. There was an overlying plow zone (Zone A), about 1 foot thick, which contained an abundance of Pisgah remains but also some remains of earlier Connestee, Pigeon, and Swannanoa occupations. This zone was dark in color and rich in organic debris. At the base of the plow zone there was an abrupt transition to a tan colored sandy loam (Zone B), which was approximately ½ foot thick. Zone B contained undisturbed remains of the Swannanoa phase, including broken pottery vessels, chipping debris, and hearths, but there were also numerous pits and post molds cutting through it from the overlying Pisgah phase occupation. Zone C, about 1 foot thick, was composed of brown sandy loam with some organic content. Within this stratum were the remains of the Savannah River phase, which included a number of irregular rock clusters and rock lined pits. Intrusive features from the Pisgah phase occupation usually extended no deeper than Zone C. Zone D, a 1-foot thick deposit of yellowish brown clay loam, contained the oldest cultural remains on the site. These consisted of scattered chipped tone artifacts of the Morrow Mountain phase. Below this, the soil graded from clay loam to clay films with an increase in weathered rock, presumably ancient river gravel. These clays and gravels, labeled Zones E, F, and G, were culturally sterile.

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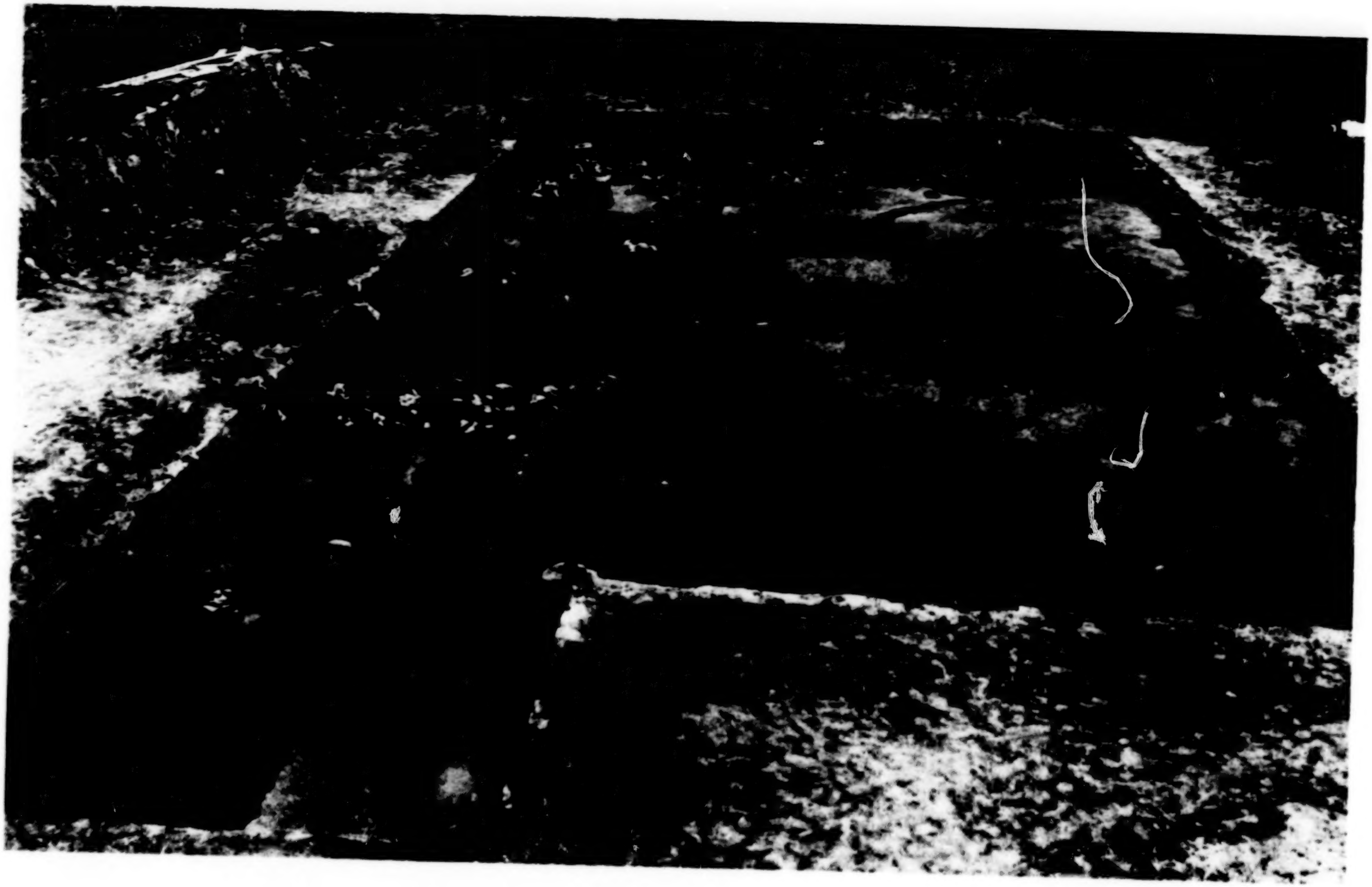

Figure 7. Excavations at the Warren Wilson site showing features and stratigraphy.

Archaeological evidence obtained from excavations at the site since 1966 indicates that the Pisgah phase village initially covered only about 0.5 acre (2,400 m^2). Subsequently, the village was enlarged or rearranged, at least seven times, as indicated by palisades that enclosed new areas, and by the overlap of older houses by newer ones (Ward 1980).

Excavation Levels

The 1973 excavations were conducted in the following levels (Ward 1973):

1) Level 1 consisted of a homogeneous loamy plowed soil, dark brown to black in color and ranging in depth from 0.2 to 0.5 ft. Artifacts of the Pisgah phase were recovered in this layer.

2) Level 2 consisted of plow scar (2a) and plow ridge (2b) soils. The average depth of this level was 0.5 ft.

3) Level 3 was described as a mottled light brown sandy soil and contained a Swannanoa cultural component. This level was also subdivided into 3a and 3b. Level 3a was an undisturbed humus zone of possible Pisgah affiliation. Level 3b represented an undisturbed layer with Swannanoa assemblage. The depth of Level 3 (a and b) was averaged to be 0.7 ft.

4) Levels 4, 5, 6, and 7 collectively represent the Archaic period occupation on this site. This soil was described as a dark brown clay, approximately 0.9 ft depth. Below this layer, sterile subsoil, described as a red-brown clay, was encountered.

Analysis of Tasks by Person Hours

Planning

The planning phase of the 1973 excavations at 31Bn29 totaled 80 person hours which consisted of two supervisors' work for 5 days (or 40.0 hours each). Planning included collecting and transporting field equipment, cutting the grass, laying out the grid, and setting up the site. A permanent site grid had been established in 1966 (Dickens 1976), so that a grid had to be laid out only in areas designated to be excavated during the 1973 season. Table 7 presents a summary of person hours by tasks.

Table 7. Summary of Person Hours by Tasks for Warren Wilson Site (31Bn29), 1973 Season.

Activity	Task	Person Hours	
Planning	Logistics/Operations		80.0
Field Work*	Primary Excavation	684.0	
	Sifting	299.0	
	Secondary Excavation	748.5	
	Water-screening	68.0	
	Mapping and Photography	696.0	
	Backfilling	201.8	
	Miscellaneous (teaching, lectures, visitors' tour, clearing site)	493.8	
	Travel	10.0	
			3201.1
Laboratory Work	Field Processing	226.0	
	Sorting, Cataloging, Labeling	1260.0	
	Supervising	480.0	
			1966.0
Final Report	Report Preparation		40.0
Overhead/Support			320.0
Total Person Hours for Project			5607.0

* Supervision included in field work categories

Field Work

The field work occurred between June 11 and August 22, 1973, for a total of 59 eight-hour work days. A total of 3,201.1 person hours were required to complete the excavation of 21 10x10 ft units, 573 post holes and 17 features such as hearths, unlined and clay lined pits, and entry trenches (Figure 8). No burials were encountered during this field season. When combined, a total of 3,427.0 person hours were required to complete the field work phase. It should be mentioned that an additional 223.0 person hours were devoted to required evening lectures, given three nights a week by the supervisors. Because this lecturing time was not directly related to field work, it was excluded from field totals of person hours. Excavation methods followed the standard RLA procedures. Shovels were used for primary dirt removal. Trowels and shovels were used at interface zones and cleaning floors and profiles. After mapping, photography, and elevation readings, each feature was excavated with trowels, spoons, and grapefruit knives.

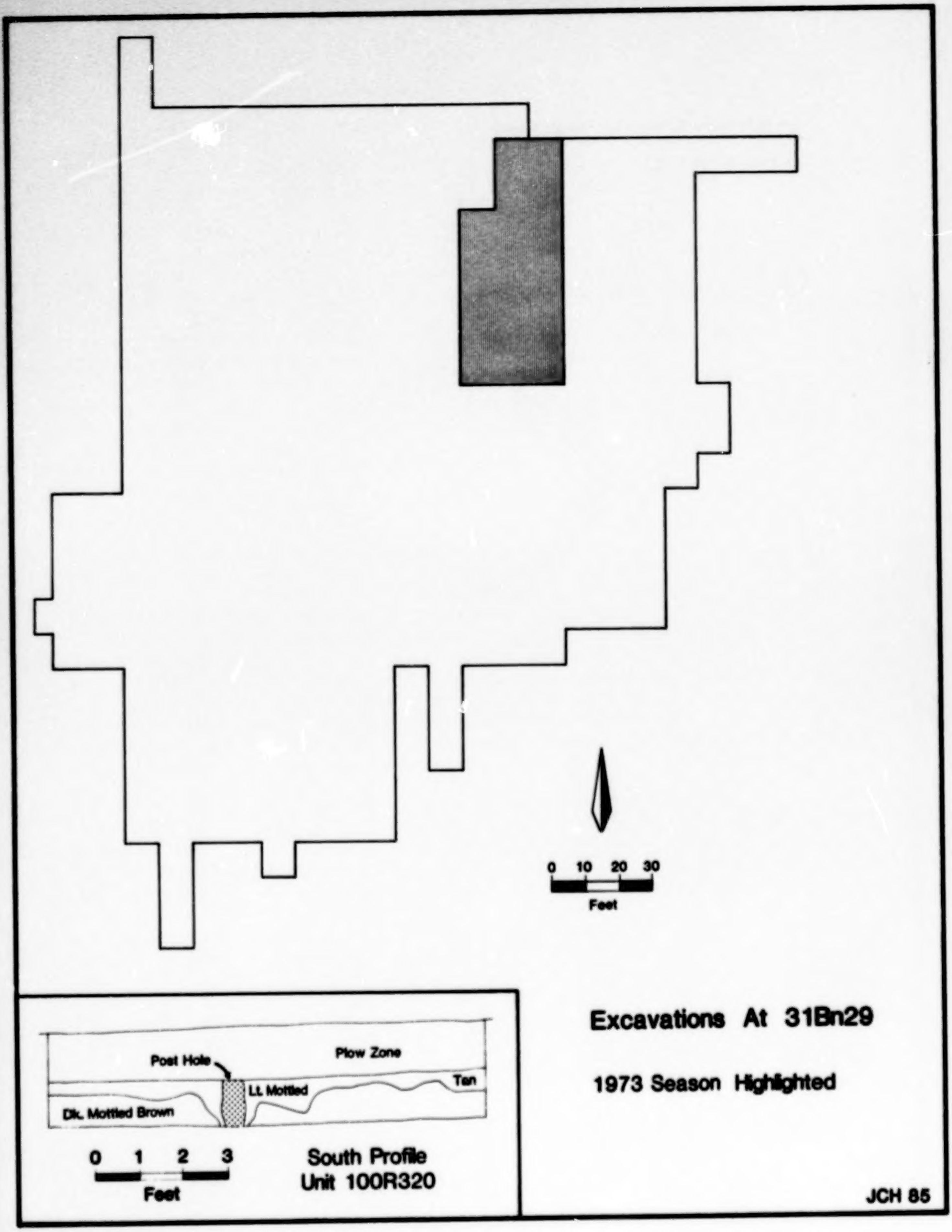

Figure 8. Map of 1973 excavations (and sample profile) at the Warren Wilson site (31Bn29).

Person hours for the field work phase were extracted from the Daily Report forms curated at the RLA. Person hours were differentiated as to specific field tasks. Since the excavations at 31Bn29 were carried out as a teaching field school, supervisors were necessarily involved in all aspects of field work and their time could not be differentiated by tasks. Person hours for volunteers and students (laborers), graduate students (technicians), and supervisors were combined for the following task categories:

a) Primary excavation, which totaled 684.0 person hours, included plow zone removal by shovels and trowels. The volume including post holes and features of a typical 10x10 ft unit averaged 140.90 ft^3 (5.21 yd^3; 3.98 m^3). Sifting primary excavation soils required 299.0 person hours (averaging 14.2 person hours per unit).

b) Secondary excavation, which required 748.5 person hours, included excavating 17 features and 573 post holes. The number of post holes per unit ranged from 0 to 79, with a mean of 27.3 post holes per unit. Total volume of soil removed from post holes equaled 181.40 ft^3 (6.72 yd^3; 5.14 m^3). Secondary excavation per unit required 35.6 person hours.

c) Water-screening the soils excavated from all features (17), using a 1/16-inch wire mesh screen, required 68.0 person hours to complete. Volume of feature soil totaled 342.16 ft^3 (12.67 yd^3; 9.69 m^3).

d) Mapping, cleaning, and photography person hours were extracted from the Daily Report forms and totaled 696.0 hours.

e) Backfilling activities occurred throughout the field season and were accomplished manually. This activity category totaled 201.8 person hours.

f) Miscellaneous person hours included time spent with field teaching and instruction, visitors' tours, and site clearing. This category totaled 493.8 person hours. Also related to miscellaneous activities were 226.0 hours spent washing artifacts on rain days and 10.0 hours of travel time for supplies. No additional travel time was recorded during the season because all personnel lived near the site, on the campus of Warren Wilson College.

A total of 226.0 hours were spent washing artifacts during rain days, when field work was impossible. Subsequent laboratory hours were spent as follows. As no laboratory records were kept for processing materials recovered from 31Bn29 during the 1973 season, interviews with RLA staff, a former graduate student and a former undergraduate student provided reasonable estimates of processing time. According to our informants, time was divided among two paid graduate student technicians and four undergraduate student laborers. It was conservatively estimated that each of these persons worked approximately 210.0 hours on the project, for a total of 1,260.0 person hours. This total included the activities of sorting, cataloging, and labeling. Supervisory time required 480.0 person hours, which included some processing tasks. As previously mentioned, no burials were encountered or excavated during this field season. In addition, no analysis of artifacts was conducted.

The total number of artifacts processed in the laboratory at RLA was 35,307. The ranges of individual specimens recovered were from 25 to 2,365 per unit, and from 2 to 1,526 per feature. The average number of specimens per unit was 1,681.3 (35,307 specimens recovered from 21 units). The specimen average for features was 208.4 (3,542 specimens recovered from 17 features). A laboratory specimen processing rate was estimated to be

20.3 specimens per hour (i.e., sorting, cataloging, labeling, and supervision). If one includes field artifact washing time, the rate changes to 17.9 specimens per hour.

Final Report

Data from the field work phase of this project was compiled and a summary report prepared by Trawick Ward. No photographs or tables were included in this 14-page report. Personnel summaries, site statistics (volume of dirt moved, person hours for field work, numbers of features, etc.), feature descriptions, and an inventory of field equipment were included. Ward estimated that 40.0 hours were required to put the report together.

Support

The services of one administrative secretary were required to process all of the necessary data forms and other records of the project. The Administrative Secretary estimated that of 320.0 hours were required.

Cost of Archaeological Activities

The following information on estimated costs of archaeological activities for the 1973 season at 31Bn29 was obtained from personnel employment records and interviews with former site workers. The costs of archaeological activities for the 1973 season are summarized in Table 8.

Table 8. Summary of Cost by Activity for the Warren Wilson Site (31Bn29), 1973 Season.

Activity	Estimated Costs ($)		Projected Costs ($)	
Equipment and Supplies				
Expendables	200.00		200.00	
Equipment	200.00		200.00	
		400.00		400.00
Transportation				
RLA vehicle ($.10 per mile)		42.00		42.00
Storage				
Temporary Laboratory Storage	144.00		144.00	
Permanent Storage and Curation (per year)	40.00		40.00	
		184.00		184.00
Labor				
Planning	392.00		392.00	
Field	4625.60		8688.36	
Laboratory	3674.00		4081.20	
Report Preparation	272.00		272.00	
		8964.00		13433.56
Publication		50.00		50.00
Overhead/Support		1176.00		1176.00
Total Costs		10816.00*		15285.56

Equipment and Supplies

Fewer supplies and equipment were purchased by the RLA for this project because some materials were provided by the co-sponsoring institution, Warren Wilson College. This category included Expendables (bags, string, nails, sheet plastic, etc.) which was estimated at $400.00, and Equipment (usage and maintenance), which was also estimated at $400.00. This cost category totaled $800.00.

Transportation

Minimal costs were incurred by this activity because field personnel were housed on campus near the site. Time and cost were estimated for the site supervisors to travel from the RLA in Chapel Hill to the site once during the 1973 field season. One RLA vehicle was required for the 420 mile round trip at a rate of $.10 per mile which totaled $42.00.

Storage

Based on the amount of artifacts recovered during this field season at 31Bn29, storage costs were estimated to be about the same as those incurred by previous projects (31Or11 and 31Sk1a). This cost category included the storage rate per ft^3 for temporary laboratory space ($144.00) and permanent university space and curation ($40.00 per year). Combined storage costs totaled $184.00.

Labor

Costs for labor exceeded all other categories for the 1973 archaeological work at 31Bn29, totaling $13,433.56. Planning cost, calculated by combining the field supervisor's time (40.0 hours at $6.80 per hour) and the field assistant's time (40.0 hours at $3.00 per hour), totaled $392.00.

Field costs could not be subdivided by field tasks but were broken down in costs for field supervisor (472.0 hours at $6.80 per hour), field assistant (472.0 hours at $3.00 per hour), and student laborers (2257.0 hours at $1.80 per hour). The total labor cost for field work was $9,095.00 and included the Projected student labor costs of $4,062.60. Laboratory labor costs, calculated for 1,260 person hours of student labor at $1.76 per hour and 480.0 hours of supervision at $3.00 per hour, totaled $3,674.40. Field laboratory costs totalled $406.80 for 226.0 hours at $1.80 per hour. Compilation of the field summary report required an estimated 40.0 hours to complete at a rate of $6.80 per hour for a total cost of $272.00.

Publication

The final 14-page field report cost about $20.00 to type and assemble. Duplication of 20 copies at $1.50 per copy produced an estimated cost of $30.00. Publication costs, therefore, totaled $50.00.

Support

The Administrative Secretary estimated that 320.0 hours were required, at $3.67 per hour for a cost of $1,176.00 to perform the required administrative tasks.

Summary

A total of 5,607.0 hours was required to complete the 1973 investigations at 31Bn29. By combining the projected costs for all categories, a total of $15,285.56 was required to complete the archaeological activities conducted at 31Bn29 in 1973. As at 31Or11 field school students were not paid, so a more reasonable estimate of actual cost to the RLA was $10,816.00. In the final assessment of archaeological activities for the 1973 work at the Warren Wilson site the following generalizations regarding costs can be made. To carry out minimal archaeological work from the planning through the reporting and curation phase it costs on the average $5.16 per ft^3 ($139.34 per yd^3; $184.29 per m^3. From the specimen perspective the archaeolgical work has a prorated cost of $.43.

CHAPTER V

The Cold Morning Site (31Nh28)
1979 Season

The Cold Morning site, 31Nh28, was chosen as the fourth site. Information on field work, laboratory processing, report preparation, and site personnel was readily available. This work was an archaeological salvage and testing program conducted at an ossuary located in the Coastal Plain physiographic province. This archaeological work was funded by NPS and conducted in 1979 by the RLA, University of North Carolina, Chapel Hill.

Joffre L. Coe, Director, RLA, served as Principal Investigator, Trawick Ward served as Field Archaeologist, and Jack Wilson was Field Assistant. Martha Graham was employed as a consultant to analyze the human skeletal remains. Six graduate students were also hired to conduct field work and carry out laboratory processing of recovered materials. The field work lasted 11 eight-hour days, beginning October 1 and terminating October 15, 1979. Final artifact processing, analysis of burial remains, and preparation of the final report (Coe, et al 1982) was done by the RLA staff and students at UNC - Chapel Hill. A condensed version of the report was later published as a volume of Southern Indian Studies (Ward and Wilson 1980).

The Cold Morning site is located in New Hanover County, North Carolina, within the Coastal Plain physiographic province. The site is situated on an old sand dune on the northwest side of Barnard's Creek. The creek flows to the southwest and empties into the Cape Fear River some 600 m from the site.

Previous archaeological work at the site was conducted in 1977 by the New Hanover County Archaeological Survey as part of a Comprehensive Employment Training Act (CETA) project. During December 1977, 12 2x2 m test pits were excavated, and in three contiguous units, an ossuary was exposed (Figure 9). Following an in situ examination of the human burial remains by a physical anthropologist, David Weaver of Wake Forest University, the ossuary was covered with a mantle of clean white sand, and the units were backfilled until further field work could be organized.

Since the site was determined eligible for the National Register of Historic Places (eligibility form on file at the Archaeology Branch, Division of Archives and History, Raleigh) and construction activities planned for the Echo Farms subdivision threatened adverse impact, a mitigation plan was written to comply with the provisions of the Archeological and Historical Preservation Act of 1974 (PL 93-291). In addition to re-excavating and removing the human skeletal remains, it was necessary to determine the size of the site and to identify its cultural components.

During the 1979 field work, 12 2x2 m test units, a 2x4 m test trench, and 35 shovel tests were excavated over the previously defined site and in surrounding areas (Figure 10). As the ossuary had been mapped and photographed by David Weaver (1978) its exact dimensions were easily determined on the ground surface. The surrounding fill was shoveled out in preparation for cleaning and removal of the bones with trowels and other small tools. When cleaning was completed, the ossuary was photographed and removed under the direction of the physical anthropologist. Individual bones were mapped, labeled, and wrapped separately. Some of the more fragile pieces were removed in a supporting soil matrix so that final cleaning could be done in the laboratory.

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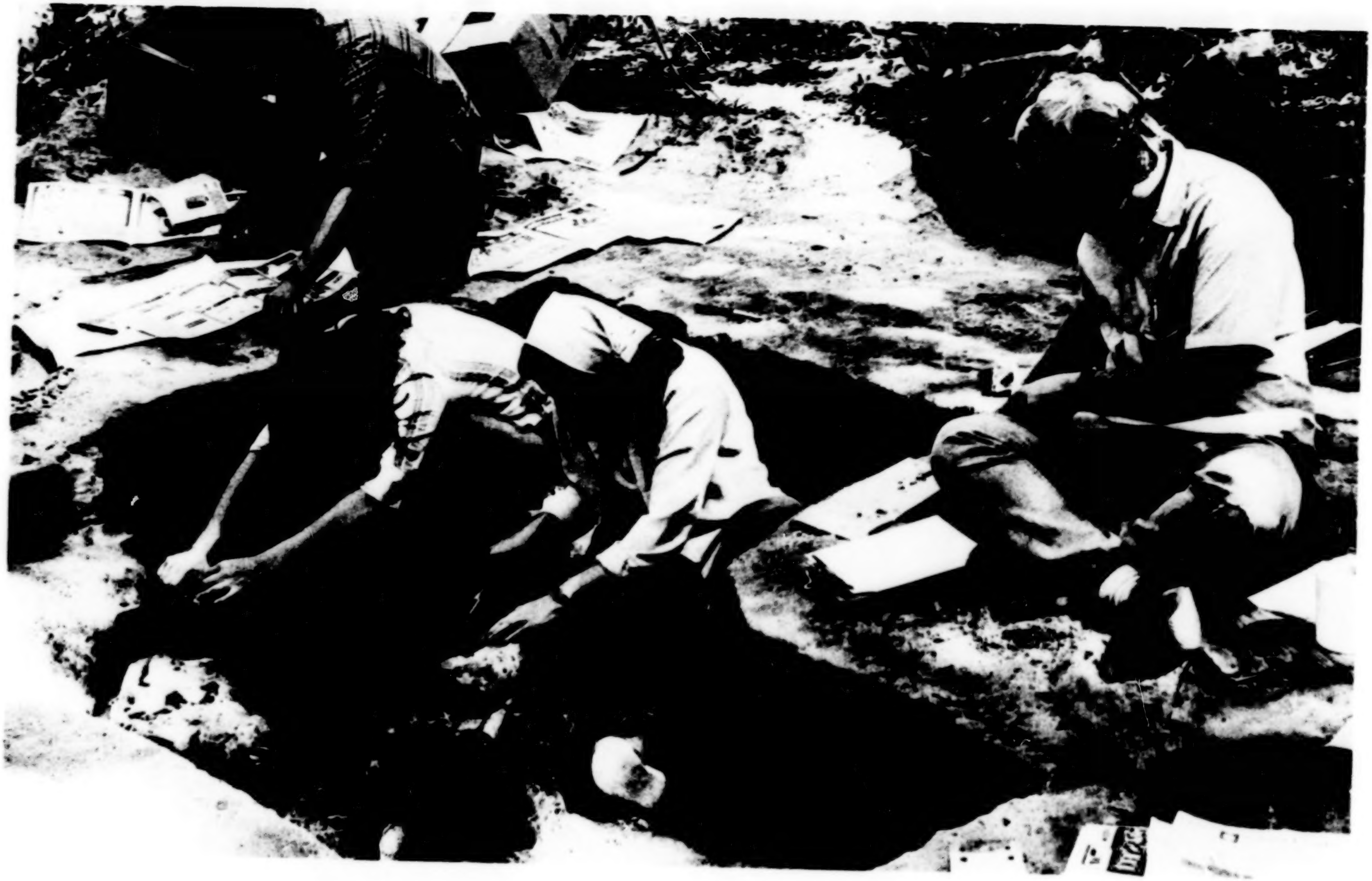

Figure 9. Excavation of the ossuary at the Cold Morning site (31Nh28).

The remainder of the site was divided into three sampling units to identify any stratified deposits and to gain additional spatial data. Three stratigraphic zones were recognized:

1) Zone A: grey sand and plow disturbed soils varying in depth from 10 to 20 cm.

2) Zone B: mottled yellow sand, excavated in two arbitrary 10 cm levels.

3) Zone C: sterile yellow sand, also removed in arbitrary 10 cm levels.

The mantle of grey aeolian sand (Zone A) was virtually sterile, with the overwhelming majority of artifacts being in the plow zone and in the top 10 cm of Zone B. The bottom half of Zone B produced a small amount of cultural material that had been pushed downward by root and rodent action. Zone C was sterile.

Analysis of Tasks by Person Hours

Planning

The planning phase of the 1979 salvage and testing program at 31Nh28 totaled 36.0 person hours. Planning activities consisted of background research on the site, contract writing and negotiation, and preparation for field work (collecting and transporting equipment to the field) Because of preliminary field work conducted at the site in 1977, site preparation (grid layout, etc.) was minimal. Table 9 presents a summary of person hours by tasks.

Table 9. Summary of Person Hours by Tasks for Cold Morning Site (31Nh28), 1979 Season.

Activity	Task	Person Hours	
Planning	Logistics/Operations		36.0
Field Work*	Primary Excavation	112.0	
	Sifting	112.0	
	Secondary Excavation	100.0	
	Mapping and Photography	22.0	
	Backfilling	5.0	
	Miscellaneous	69.0	
	Travel for supplies	24.0	
			454.0
Laboratory Work	Washing, Cataloging and Labeling	40.0	
	Analysis (Ceramics only)	40.0	
	Processing Burial Remains (N = 16)	1300.0	
	Supervision and analysis	1040.0	
			2420.0
Final Report	Preparation of maps, drawings, and photographs	80.0	
	Report Preparation	228.0	
			308.0
Overhead/Support			100.0
Total Person Hours for Project			3318.0

* Supervision included in field categories

Field Work

Field work at the Cold Morning site consisted of 11 days of archaeological investigation in the fall of 1979. A total of 454.0 person hours was required to complete the field work. Workers excavated 12 2x2 m test units, one 2x4 m test trench, and 35 unstructured shovel tests (Figure 10). Only one feature, a 1.5 m (NE/SW) x 1.0 m (NW/SE) ossuary, with an average depth of 0.19 m was uncovered. The total volume of the feature measured 0.28 m^3 (0.36 yd^3; 10.0 ft^3). It contained the skeletal remains of at least 16 individuals.

Excavation methods were separated into two procedural formats. In the area of previous (1977) CETA investigations, the ossuary and immediate units were excavated in the following manner:

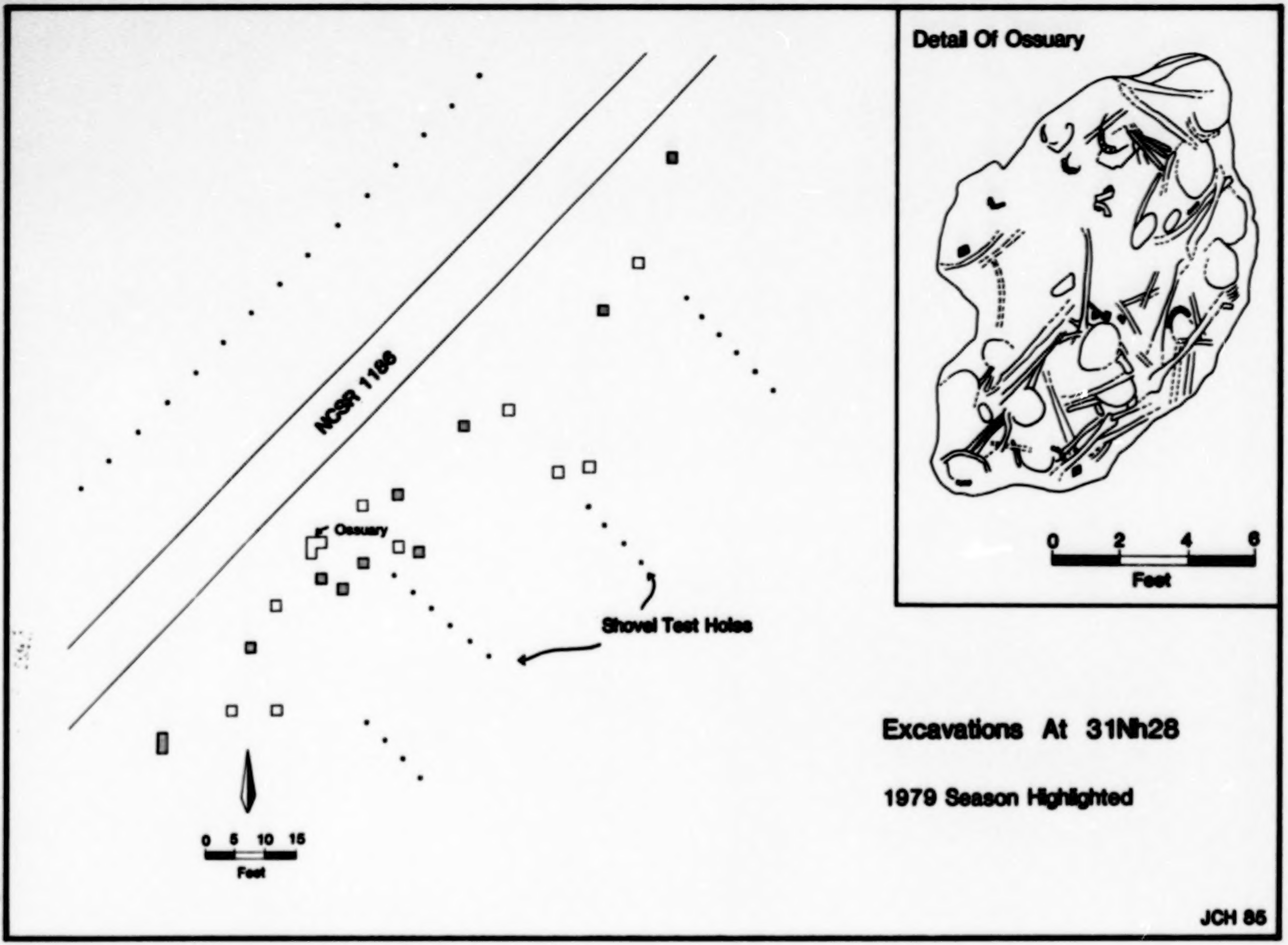

Figure 10. Map of 1979 excavations (and detail of ossuary) at the Cold Morning site (31Nh38).

a) CETA backfill was removed with shovels.

b) The interface along the ossuary border and its overburden were removed with trowels to expose the white sand cover.

c) The white sand layer was brushed away and/or removed using an aerosol lint and dust remover.

d) The cleaned burial pit was photographed and mapped.

e) Individual bones were labeled and removed, with fragile items being retained in a soil matrix, for later cleaning in the laboratory.

In previously untested areas of the site, shovel tests and test units were excavated utilizing a second format, which was essentially the standard field procedures of the RLA as described in Chapter I of this report. The 35 shovel tests averaged 0.3x0.3 m and were backfilled upon completion of mapping. No midden or features were uncovered in tested areas away from the ossuary.

Person hours for the field phase were derived from Daily Report Forms on file at the RLA. Person hours for the six graduate student technicians, one field assistant, and one field supervisor were combined for each specific task category. All workers were periodically engaged in all aspects of field investigations.

The field hours for backfilling, sifting and primary excavation were combined on the Daily Report Forms. Interviews with the field supervisor and the field assistant allowed an estimate of each task. The 15.0 person hours required for backfilling were subtracted from the total combined hours extracted from the Daily Report Forms, leaving 224.0 person hours for excavation. The person hours for sifting and primary excavation were divided equally to estimate the person hours required per task. Person hours per specific task category were as follows:

1) Primary excavation, totaling 112.0 person hours, included 6.0 person hours for excavating 35 shovel tests, or 5.8 shovel tests per hour. The remaining person hours were spent removing Zones A and B and white sand covering with trowels and shovels. The volume of non-feature soils removed from units totaled 28.22 m^3 (36.89 yd^3; 996.03 ft^3). On the average 7.6 person hours were required to excavate one 2x2 m square.

2) Secondary excavation, which totaled 100.0 person hours, consisted of clearing, cleaning, and removal of the ossuary. The volume of this soil was 0.28 m^3 (0.36 yd^3; 10.0 ft^3).

3) Sifting included all dirt screened from shovel tests, primary and secondary excavations. All soils were screened through ½-inch (66 mm) wire mesh (water screens were not used at the site). Person hours employed in screening amounted to 112.0. Six person hours were required to screen shovel test soils. The remaining 106.0 hours were utilized screening test trench and test unit soils. It is estimated that 7.6 person hours were used to screen an average 2x2 m unit.

4) Person hours for mapping, cleaning, and photography totaled 22.0 hours. Eight of these hours were needed for recording shovel tests, and the remaining 14.0 hours were utilized in recording profiles and the plan of the ossuary.

5) Backfilling activities were estimated at 15.0 person hours; 12.0 hours for the 12 2x2 m units (one unit per hour), 2.0 hours for the trench, and 1.0 hour for all shovel tests.

6) Miscellaneous person hours included time spent clearing and laying out the site grid. Also included was time spent obtaining field equipment, as needed. A total of 69.0 person hours was estimated for this task category.

7) Travel time to the site from Chapel Hill was estimated to be 3.0 hours one way. Two round trips for two vehicles totaled 24.0 hours in travel time.

Laboratory

Because no records exist for the person hours involved with processing materials from 31Nh28, interviews were conducted with the former Laboratory Supervisor, and a graduate student technician, who estimated that the processing of artifacts, including sorting, washing, cataloging and labeling, involved 40.0 person hours. Analysis of ceramic artifacts was estimated to have required 40.0 person hours. A total of 80.0 person hours was used in artifact processing and analysis.

In addition to artifacts, there were 16 individual human burials (11 adults, four subadults, and one neonate), and a number of random human bones. According to Homes Wilson, the processing and analysis of burials was conducted by two graduate student technicians who worked approximately 650.0 hours each. Burial processing was supervised by a staff member for 1,040.0 hours; for a total of 2,340.0 person hours involved in burial processing and analysis. Combined with the 80 person hours for artifact processing and ceramic analysis, a total of 2,420.0 person hours was required for laboratory work on 31Nh28.

The total number of artifacts processed in the RLA laboratory was 1,357. There werre 12 2x2 m units and one 2x4 m trench. The range of individual artifacts recovered was 5 to 196 per unit. The average number of artifacts per unit and the test trench was 104.3 (1,357 artifacts recovered from 14 units). The artifact processing rate in the laboratory was estimated to be 17.0 artifacts per person hour (sorting, washing, cataloging, and labeling of 1,357 artifacts in 80.0 person hours). The processing and analysis rate for burial remains was estimated to be 146.3 person hours per burial.

Final Report

A detailed final report was prepared by the staff and students. It consisted of two sections. The first section summarized field work and artifact analysis, and the second presented analysis of the ossuary remains. The report included 18 tables, 18 photographic plates, two inked drawings, and 100 pages of text. Six people participated in the production of this report, for a total of 308.0 person hours.

Support

The services of one administrative secretary were required to process all of the necessary data forms and type the final report. The Administrative Secretary, estimated that 100.0 hours of time was required. Because artifact recovery was minimal compared to other sites reported herein, field forms and data sheets were also minimal. Report preparation and burial data forms required the bulk of her time on this project.

Cost of Archaeological Activities

The following information on estimated costs of archaeological activities for the 1979 field work at 31Nh28 was obtained from the proposed budget report prepared for NPS by the RLA staff, and interviews with former project workers. As outlined in Table 10, the costs by activity categories follow the format presented in the 31Or11, 31Sk1a, and 31Bn29 reports. Specific differences, as they relate to costs, are presented below.

Table 10. Summary of Cost by Activity for the Cold Morning Site (31Nh28), 1979 Season.

Activity	Estimated Costs (\$)*	
Equipment and Supplies		400.00
Transportation		228.00
Housing		300.00
Storage		
Temporary Laboratory Storage	144.00	
Permanent Storage and Curation (per year)	20.00	
		164.00
Labor		
Planning	283.64	
Field	2695.44	
Laboratory	11720.00	
Report Preparation	1680.00	
		16379.00
Publication		900.00
Special Services		
C^{14} Dating (2 @ \$150.00 each)	300.00	
Environmental Analysis (flora, fauna)	100.00	
		400.00
Overhead/Support		733.00
Total Estimated Costs		19504.08

* There are no Projected Costs for this site because all labor was paid--no volunteers.

Equipment and Supplies

Due to the brevity of field work and the limited nature of the excavation, few supplies and equipment were purchased by the RLA for this project. A budget figure of $200.00 for Expendables was given in the project proposal. Equipment (usage and maintenance) was estimated to cost $200.00 as well. Therefore, this cost category totaled $400.00.

Transportation

Two round trips from Chapel Hill (approximately 300 miles) were necessary for the 11-day project. Two vehicles were required to carry equipment and crew at a cost of $.19 per mile. This totaled $228.00, or $114.00 per vehicle.

Housing

Housing for the field crew and supervisors was provided by the RLA. Two weeks were required at a rate of $150.00 per week, for a total of $300.00.

Storage

Based on the small amount of artifacts recovered from this site and the total boxes for storage of human burial remains, storage costs were estimated to be less than those incurred for the previously reported projects (31Or11, 31Sk1a, and 31Bn29). The cost category for temporary laboratory storage during processing was the same, at $144.00. Permanent university storage was less, however, at $20.00 for the total volume of storage space per year. Combined storage costs totaled $164.00.

Labor

Costs for labor exceeded all other cost categories for the 1979 archaeological activities at 31Nh28, totaling $16,379.08. Planning cost, calculated by combining the field archaeologists time (28.0 hours at $9.13 per hour) and the field assistant's time (8.0 hours at $3.50 per hour), totaled $283.64.

Labor costs for archaeological field work totaled $2,695.44. One field supervisor was employed for 88.0 hours at a rate of $9.13 per hour. The total cost for the field supervisor was $803.44. The field assistant received a salary of $3.50 per hour for 88.0 hours, for a total of $308.00. The combined cost of six graduate student technicians paid $3.00 per hour was $1,584.00. Laboratory labor costs included one graduate technician for processing of artifacts (sorting, washing, cataloging and labeling) at $3.50 per hour for 40.0 hours, and analysis of ceramics at $3.50 per hour for 40.0 hours; two graduate technicians were employed for processing and analysis of burial remains at $3.00 per hour for 650.0 hours each and supervision of burial processing and analysis by a staff supervisor at $7.25 per hour for 1,040.0 hours. The total cost of labor for laboratory processing and analysis of artifacts and burial remains was $11,720.00: $140.00 for artifact processing, $140.00 for ceramic analysis, $3,900.00 for human burial processing and analysis, and $7,540.00 for supervision of burial processing and analysis.

Compilation of the final report (Coe, et al : 1982) required the time of several people. Ceramic analysis summary cost $24.00, Section I writing cost $720.00, Section II writing cost $300.00, preparation of drawings cost $168.00, preparation of photographic plates cost $288.00, editing and final assembling cost $180.00. Combined, the total cost for report preparation was estimated to be $1,680.00.

Publication

The final report with 100 pages of text, 18 photographic plates, 18 tables, and two drawings cost an estimated $500.00 to produce one original. Duplication was calculated at $8.00 per copy, and 50 copies were made. This cost category totaled $900.00.

Special Services

Two radiocarbon samples were analyzed from the 1979 field work, at a cost of $150.00 per sample. One hundred dollars was paid for analysis of the floral and non-human faunal remains. Special services costs totaled $400.00.

Support

This cost category was obtained by estimating the time for one Administrative Secretary to perform the necessary clerical services required for the 1979 archaeological investigation at 31Nh28. A total of 100.0 hours was required, at $7.33 per hour, for a total cost of $733.00.

Summary

An estimated total of 3,318.0 person hours was required to complete the 1979 archaeological investigations at the Cold Morning site, 31Nh28. By combining the estimated costs for all categories, a total of $19,504.08 was required to complete the archaeological activities conducted at the Cold Morning site in 1979. A final assessment of archaeological activities can be obtained by comparing person hours and estimated costs. The total Estimated Cost of $19,504.08 divided by the total volume of soil (1,006.03 ft^{3}; 37.25 yd^{3}; 28.50 m^{3}) removed from the site produced an average cost of $19.39 per ft^{3} ($523.60 per yd^{3}; $684.35 per m^{3}) for all archaeological activities associated with the investigation of the site. Cost per specimen (predominantly human burial remains) was calculated to be $14.37.

Chapter VI

The Garden Creek Mound Site (31Hw1)
1965 Season

The Garden Creek Mound No. 1 (31Hw1) (Dickens 1970, 1976 ; Keel 1972, 1976), was chosen for analysis because it represents archaeological research conducted at a prehistoric mound site. The Garden Creek site is located in Haywood County, North Carolina, within the Appalachian Summit Region of the Blue Ridge physiographic province. Mound No. 1 was the largest of three mounds in the Garden Creek complex. It was excavated in its entirety by the RLA during the summer and fall months of 1965, 1966, and 1967. Work during the 1965 season focused on the excavation of two test trenches into the mound, and the removal of plow zone soils from the northeast and southeast mound slopes and from an area on the eastern mound periphery (Figure 11). The results of "this work revealed sections of two eroded floors, portions of a ramp, and a number of intrusive post molds, pits, and burials" (Dickens 1976:73).

The 1965 excavations were carried out by the RLA staff under the supervision of Joffre L. Coe. The crew was composed of University of North Carolina students, local residents, and volunteers. The size of the crew fluctuated between four and 16 people, with an average size of seven. The field season lasted 43 days. Preliminary artifact processing in the field consisted of washing and sorting. Final artifact processing and completion of a field work summary report were done by RLA staff and students in Chapel Hill.

Dickens (1976:69) describes the Garden Creek site complex as follows:

> The Garden Creek site occupies approximately 12 acres on the south side of the Pigeon River, just upstream from its juncture with Garden Creek, in Haywood County, North Carolina. Several roughly contiguous sites are involved. Mound No. 1 (31Hw1) is located on the Northeast end of the site.
>
> It has an associated village midden that covers about 5 acres (31Hw7). On slightly higher ground, about 1,000 feet west of the first mound, is situated Mound No. 2 (31Hw2). This mound, first tested by a local resident for the Valentine Museum in 1880, has an adjacent 4-acre village midden (31Hw8). The remnant of a third mound (31Hw3), extensively excavated by the Heye Foundation in 1915, is located on the southern margins of the site. Here there is no apparent associated village midden.

The cultural components present at Mound No. 1 (31Hw1) and the associated village (31Hw7) were primarily Pisgah phase, although a historic period Cherokee component (Qualla) was represented by Euro-American trade items and ceramics. Some evidence of earlier occupations (Woodland and Archaic) was present on the surface, and in various mound fill zones.

Prior to excavation in 1965, the heavily plowed and eroded mound stood about 7 feet high at the center and measured approximately 130 ft north-south by 150 ft east-west (Figure 12). The overall mound conformation was found to be roughly rectangular, with the longest axis extending east-west and the ramp remnant facing east. The initial excavations were in the form of two 5 ft wide trenches, one extending from the

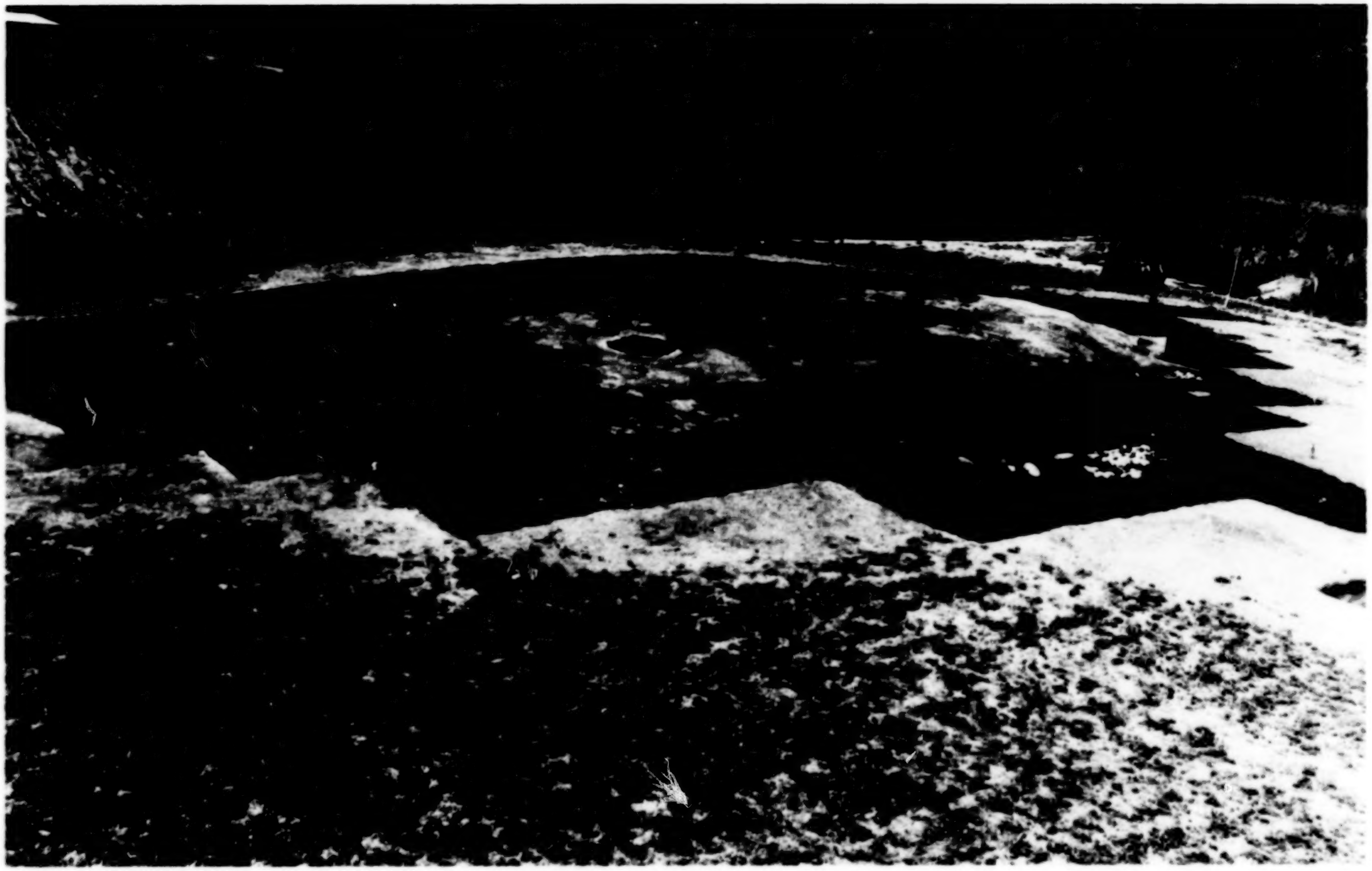

Figure 11. Excavation of the upper portion of the Garden Creek mound.

northeast and another from the southeast. These test trenches were begun at points away from the mound and extended inward. They were only excavated to the base of the plow zone. Deep cuts into the extant mound were avoided in order to preserve the remaining portions of floors and mound construction stages. Important stratigraphic profiles were recorded at the mound margins and were documented in successive stages as the horizontal stripping progressed. Detailed field records were kept for all phases of these excavations, and a 5x5 ft balk was left intact for future archaeological reference.

In summarizing the complex stratigraphy of the mound, Dickens (1976:80) listed eight distinct layers, excluding intrusive pits, burials, and post molds. Beginning at the surface and extending to subsoil, the layers were described as:

1) Plow zone
2) Mound outwash
3) Grey-tan mound fill
4) Yellow clay mound fill
5) Clay cap of Floor 1
6) Dark lensed mound fill
7) Grey-brown mottled layer
8) Pre-mound humus layer

The pre-mound humus rested on subsoil. A layer of river boulders had been placed on top of the pre-mound humus layer prior to mound construction.

An interpretation of the chronological events associated with this mound is provided by Dickens (1976:87):

> A hypothetical reconstruction of the sequence of ceremonial constructions at Mound No. 1 (31Hw1) begins with the erection of a semisubterranean, earth covered building on a portion of the old village surface. After a relatively brief period of time, a second earth lodge was built adjacent to the original structure, and the two were then used simultaneously. Following the completion of the earth lodges, and again after some unknown interval of time, a multi-corridored arrangement of posts was set up adjacent to the lodges. It is not known whether this elaborate construction was roofed. It is possible that there was some form of lightweight covering, consisting of straw or small branches, which would have created a large open air structure such as might have been used for public gatherings during the warmer months.
>
> Either at a point when the earth lodges were becoming dilapidated or at a time when some social or religious event signaled the need for new ceremonial architecture, a layer of boulders was placed over the area of the post construction and onto the west flanks of the earth lodges. Some posts were left standing, but rocks were laid directly on top of those that had fallen. Then, basketloads of soil collected from old midden areas were piled over the rocks and remaining posts. This fill was raised nearly to the height of the earth lodge roofs, and then a cap of clean yellow clay was spread over the top of the fill and up to but not covering the tops of the earth lodges. On this surface (Floor 1) a construction was begun, but it was only partly finished when the earth lodge roofs collapsed, creating two large concavities on the front floor of the mound. When these depressions had been

> filled with more midden soil, the old roof areas were covered with a thin cap of clay (Floor 1-A). This provided a clay floor over the entire raised surface, which at this time measured approximately 50x70 feet.
>
> Before this surface could be put to use, however, the earth lodges collapsed further, resulting in the addition of a completely new cap of clay over the entire mound. This surface (Floor 2) was covered with a thin layer of clean sand. Although Floor 2 continued to sag on the east side, it was stable enough to serve as the base for the first completed ceremonial constructions. At least two buildings were erected at different periods on the more trust worthy western portion of Floor 2, a total of seven burials was placed in the eastern portion, and a log palisade was built around the entire top perimeter. The mound went through several building stages subsequent to Floor 2, and its final use was during the Qualla period.

The 1965 season excavations were carried out using the following levels/vertical units:

1) Plow soils were subdivided into four separate levels, ranging in depth from .05 to 1.0 ft with PZ 1 being the upper level and PZ 4 being the lower level.

2) Below plow soils, up to ten "undisturbed" levels were recorded. "Undisturbed Level 1" was located immediately below PZ 4. The depth and quantity of undisturbed levels varied throughout the mound, depending on the location of the excavation unit. Some units contained only six undisturbed levels, whereas others contained as many as ten.

3) Mound specific levels were also isolated and excavated in sequence. These levels were described as "mound fill," "mound slump," and "clay cap."

Analysis of Tasks by Person Hours

Planning

The field archaeologist estimated that a total of 240.0 person hours were required for planning the 1965 field work at 31Hw1. The planning phase of this project included time spent negotiating with the landowner for permission to excavate, organizing a crew, establishing a field station, setting up a work schedule, collecting and transporting field equipment, and preparing the site (shed construction, sifter building, repairs, etc.).

Other information that could not be gleaned from field records or other documents was obtained from personal interviews with former site workers. Table 11 provides a summary of estimated person hours by tasks for the Garden Creek Mound site during the 1965 field season.

Table 11. Summary of Person Hours by Tasks for the Garden Creek Mound Site (31Hw1), 1965 Season.

Activity	Task	Person Hours	
Planning	Logistics/Operations		240.0
Field Work	Primary Excavation	674.0	
	Secondary Excavation	353.0	
	Sifting	95.8	
	Mechanical Screening	365.5	
	Water-Screening	54.0	
	Mapping and Photography	245.5	
	Backfilling	328.8	
	Miscellaneous (clearing site and placing site grid)	520.5	
	Travel for supplies	22.8	
			2660.0
Laboratory Work	Washing, Cataloging and Labeling	3000.0	
	Supervision	1200.0	
			4200.0
Final Report	Field Summary Report Preparation	200.0	
	Duplication	40.0	
			240.0
Overhead/Support			480.0
Total			7820.0

Field Work

The field work phase of the project began on June 7 and continued intermittently until November 23, 1965 (June 7-27 and October 21-November 23) for a total of 43 working days. A total of 2,565.0 person hours were required to complete excavation of approximately 306 5x5 ft units, 12 burials, 78 features and 98 postholes (Figure 12). An additional 95 person hours were used during rain days for miscellaneous tasks. A combined total of 2660.0 person hours were required to complete the field work phase. Person hours for the field work phase were derived from the Daily Report Forms prepared in the field and archaeological field notes curated at the RLA. Person hours were differentiated by specific field tasks.

Supervisory hours for the field director and field assistant were included within each category, as both were often also engaged in general excavation activities.

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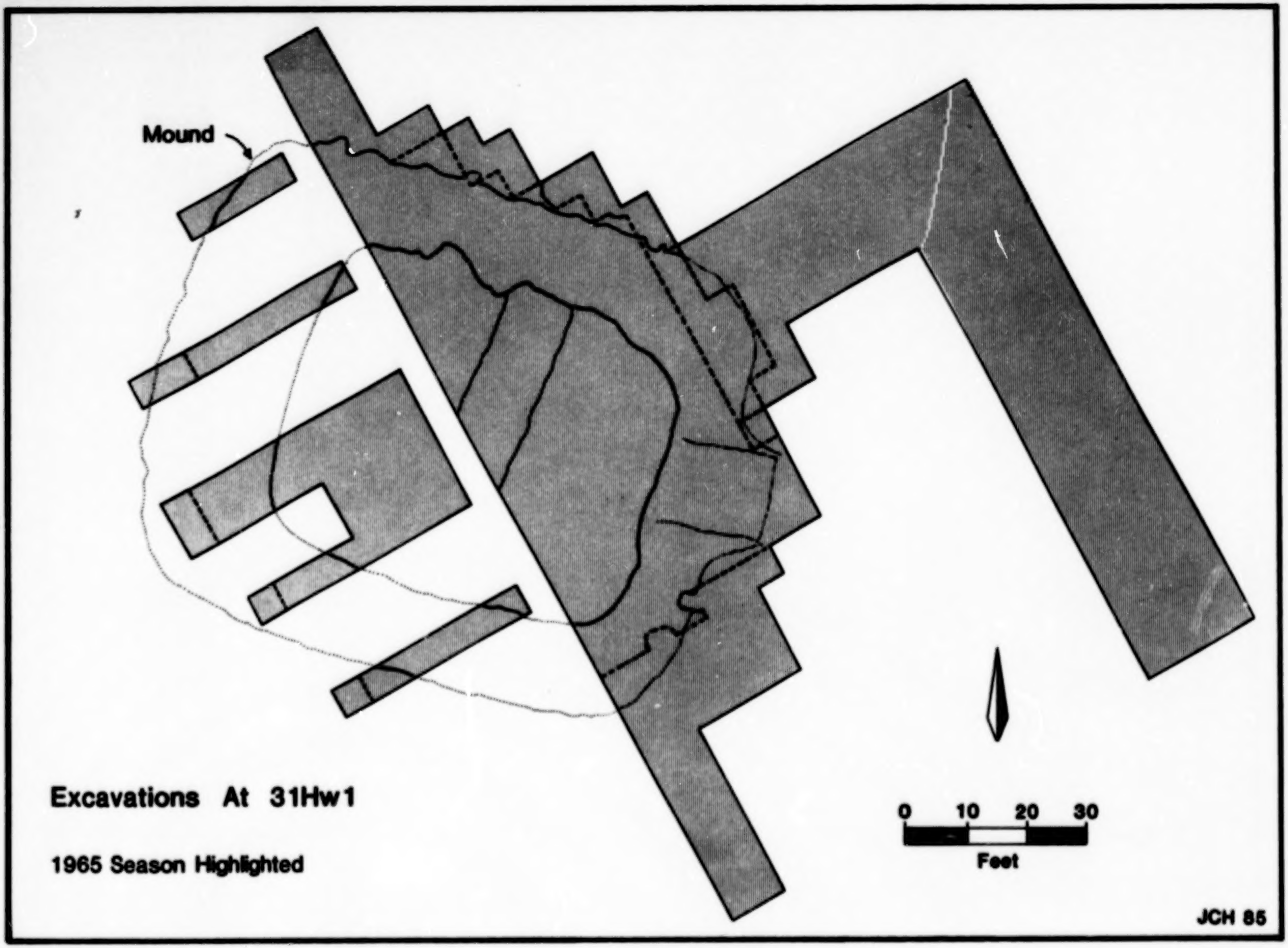

Figure 12. Map of 1965 excavations at Mound No. 1, Garden Creek site (31Hw1).

Person hours for field supervisor, graduate field assistant, graduate student technicians, locally hired laborers and volunteers, were combined by task category. The number of field workers ranged from four to sixteen. For the majority of field days, an average of seven field workers were engaged in the following tasks:

a) Primary excavation, which totaled 674.0 person hours, was undertaken on plow zone, mound fill and floor layers using trowels and shovels. The average volume of plow zone extracted from one 5x5 ft unit was estimated as measuring 15.38 ft^3 (0.57 yd^3; 0.43 m^3). The average volume of all non-feature soil within one 5x5 ft unit was estimated to be 31.12 ft^3 (1.15 yd^3; 0.87 m^3).

b) Secondary excavation, which required 353.0 person hours, included all hours spent excavating the approximately 78 features, 98 postholes, and 12 burials. The number of known postholes per unit ranged from 0 to 25, with an average of 3.1 (306 postholes in 98 units). The average and total volume of soil removed from postholes was not discernable from the data sheets. The total volume of soil removed from the 78 features (pits), however, was extrapolated from feature forms. The total volume of feature soil was 1,255.02 ft^3 (46.48 yd^3; 35.14 m^3) with an average feature volume of 16.09 ft^3 (0.59 yd^3; 0.45 m^3) The data sheets contained detailed measurements for one burial, Burial 4. This burial measured 3.5 ft wide, 4.0 ft long, and 1.5 ft deep. The total volume of Burial 4 was estimated to be 20.44 ft^3 (0.76 yd^3; 0.57 m^3).

c) Manual and mechanical dry-screening of all soils (excluding burial soils) was accomplished using ½-inch and ¼-inch wire mesh screen. These two categories required 461.3 person hours to complete. Water-screening of all soils removed from the 12 burials required 54.0 person hours, using 1/8-inch wire mesh.

d) Person hours spent mapping, cleaning and photographing units and features totaled 245.5 hours.

e) Backfilling occurred throughout the field season and was accomplished manually. This task totaled 328.8 person hours.

f) Miscellaneous person hours included time spent clearing and gridding the site, tours for visitors, compiling field notes, and training field workers. These activities comprised a total of 425.5 person hours. Also included in this task was a total of 22.8 person hours spent traveling to and from the site for supplies. Ninety-five personal hours expended on rain days in the field for miscellaneous activities are also included in this category.

Laboratory Work

As no records for processing materials from 31Hw1 were kept for the 1965 season, project supervisor Bennie C. Keel was interviewed, and field records were examined in order to obtain estimates of processing time and costs. According to this information, a total of four graduate student technicians participated in processing of the materials, which included sorting, washing, cataloging and labeling; although some preliminary washing was done in the field. It is estimated that 100.0 person hours were spent each week (2.5 technicians working 40.0 hours each) on materials from 31Hw1 for approximately 30 weeks, for a total of 3,000.0 person hours for laboratory processing. In addition the laboratory supervisor spent a total of 600.0 hours, and Coe and Keel together provided another 600.0 hours of supervision. A total of 4,200.0 person hours was used in processing of materials from the 1965 season at 31Hw1. It should be noted that no formal morphological burial analysis was conducted, although 12 burials were excavated, treated, counted, and identified.

The total number of artifacts processed in the RLA laboratory was 157,123. These were recovered from 306 units, 78 features, and 12 burials according to records entered in the Specimen Catalog for the 1965 season at 31Hw1. For the units, the range of individual artifacts recovered was from 0 to 1,979, with an average of 453.4 artifacts per unit (138,728 artifacts from 306 units). For features, the average number of artifacts recovered was 225.5 per feature (17,586 artifacts from 78 features). The average number of artifacts recovered from the burials was 201.7 (2,420 artifacts from 12 burials). An overall laboratory processing rate for artifacts from the 1965 season is estimated to be 37.4 artifacts per person hour.

Final Report

According to available information, no final field summary report was ever compiled for the 1965 field season at 31Hw1. Much of the field data from this season, however, was incorporated into later reports. Therefore, it was suggested that we substitute the estimated hours involved with finalizing the field data forms for the 1965 season in this task category. An estimated total of 40.0 person hours (of supervisor's time) was required to complete the 1965 field data forms for 31Hw1. J. Jefferson Reid spent approximately 10.0 hours per week for 5 months (200.0 hours total) in drafting maps and profiles, photographic work, checking plot sheets and data forms.

Support

A new administrative secretary was hired at the end of the 1965 season. She provided a liberal estimate of 480.0 person hours to process all of the field and laboratory data forms accumulated during archaeological investigations at 31Hw1.

Cost of Archaeological Activities

The following information on estimated costs of archaeological activities for the 1965 season at 31Hw1 was obtained from UNC's Employment Records Division (for wages), Property Management Office (for storage costs), and interviews with former site personnel (for wages). A summary of costs for this project is provided in Table 12.

Table 12. Summary of Cost by Activity for Garden Creek Mound Site (31Hw1), 1965 Season.

Activity		Estimated Costs ($)		Projected Costs ($)
Equipment and Supplies		400.00		400.00
Transportation		667.00		667.00
Housing				
Rent for 6 months	600.00		600.00	
Per diem	215.00		215.00	
		815.00		815.00
Storage				
Temporary Laboratory Storage	144.00		144.00	
Permanent Storage and Curation (per year)	40.00		40.00	
		184.00		184.00
Labor				
Planning	869.20		869.20	
Field	4308.08		4412.72	
Laboratory	7458.00		7458.00	
Report Preparation	727.00		727.20	
		13362.48		13467.12
Publication		50.00		50.00
Special Services				
2 C^{14} dates at $125.00 each		250.00		250.00
Overhead/Support:		787.20		787.20
Total Costs		16515.68		16620.32

Equipment and Supplies

Because this project took place 20 years ago, the cost estimates for supplies and equipment are considered liberal. Expendables (bags, nails, string, plastic sheeting, etc.) were estimated to have cost $200.00 for the 43 field days. Equipment was estimated to cost $200.00 and included maintenance and minimal repair. This cost category, therefore, totaled $400.00.

Transportation

Transportation costs were estimated by approximating the number of round trips made to the Haywood County site from the RLA in Chapel Hill, to haul artifacts and field equipment. It was estimated that 13 round trips were made during the 6 months in the field. One round trip was 480 miles multiplied by 13 trips produced 6,240 miles of travel. One RLA vehicle at $.10 per mile cost of $624.00. Daily mileage averaged 10 miles per day (10 miles travelled during each of 43 field days) which yielded an additional $43.00 cost. Transportation totalled $667.00 in cost.

Housing

Housing for the field crew was provided by the RLA at the field station which was located near the site. Rent including utilities was $100.00 per month. The field archaeologist received $5.00 per diem, for a total of $215.00.

Storage

According to the UNC Property Management Office, the cost per ft^2 of university warehouse storage space in 1965 was $.40 (the same as today). Therefore, the same rates for temporary and permanent storage, as presented in the previous cost assessment reports, can also be applied to this project. Temporary laboratory storage was $144.00, and permanent storage cost $40.00; totaling $184.00 for this cost category.

Labor

Labor accounted for the largest expenditure during the 1965 archaeological work at 31Hw1. Actual salary information for site personnel paid by the RLA was obtained from the Employment Records Division at UNC. An hourly rate for archaeologist (staff), supervisor (staff), and student laborers was calculated in order to assess cost by person hours for each task. Labor cost for Planning, required 40.0 hours for the supervisor at $5.28 per hour for a total of $211.20; 100.0 hours for the field archaeologist at $3.68 per hour for a total of $368.00; and 100.0 hours of the field assistants time at $2.90 per hour for a total of $290.00 for a grand total of $869.20. Field labor costs could not be subdivided by field tasks. Projected Field labor costs were determined for the field archaeologist (344.0 hours at $3.68 per hour), field supervisor (344.0 hours at $2.90 per hour), and paid students (1,971.8 hours at $1.09 per hour). As a result, the 2,660.0 person hours of field work cost a total of $4,412.72 (which includes 96.0 hours of volunteer time at $1.09 per hour, or $104.64). Therefore Estimated Field Costs were calculated to be $4,308.08.

Labor costs for laboratory processing of materials included four graduate student technicians for sorting, washing, cataloging, and labeling artifacts at $1.09 each per hour for an estimated 3,000.0 person hours, which yields an estimated cost of $3,270.00. RLA staff members supervised the laboratory processing a total of 1200.0 hours at a cost of $4188.00. In summary, the total cost for laboratory processing of specimens from 31Hw1 was $7,458.00. This includes sorting, washing, cataloging, and labeling of materials, and supervision of the process. As no formal morphological analysis was done on the burials, no extra cost was incurred in their treatment. Also, no formal artifact analysis was conducted.

While important archaeological information obtained from the 1965 field season at 31Hw1 was incorporated into several scientific monographs (Dickens 1970, 1976 and Keel 1972, 1976), no final field report was actually prepared. Therefore we substituted the supervisor's time involved with completing the field data forms for the 1965 season and his assistant's time engaged in cartographic photographic, and records keeping work. These efforts minimally represent the costs of a report for the season's work (240.0 hours).

By combining Estimated Labor Costs for Planning, Field Work, Laboratory processing, and Report Preparation, a total of $13,362.48 was obtained. Projected Labor costs (which includes volunteer field time) totaled $13,467.12.

Publication

It should be reiterated that no final field summary report was written for this season's work, and therefore, no costs for publication were incurred. As a substitute, the cost of $50.00 for duplication of the field data forms was entered in this cost category.

Special Services

Two radiocarbon analyses were obtained from the 1965 field season. It was estimated that the cost for analysis of the C^{14} samples was $250.00 ($125.00 each).

Overhead/Support

Salary information for the secretary was obtained through the UNC Employment Records Division. By multiplying her hourly rate ($1.64) with the estimated person hours of her time involved in completing the 1965 archaeological investigation (480.0), an estimated cost of $787.20 was provided.

Summary

A total of 7,820.0 person hours was required to complete the 1965 archaeological activities at 31Hw1. By combining the estimated costs for all task categories, a total of $16,515.68 was required to complete the 1965 archaeological investigation at 31Hw1, the Garden Creek Mound site. For the final cost assessment of archaeological activities conducted at this site in 1965, the total cost was divided by the units excavated. This produced a cost of $53.97 per archaeological unit ($1.73 per ft^3; $46.69 per yd^3; $61.76 per m^3) to carry out the scientific investigation. Projected Costs for all task categories were $16,620.32 and produced a cost of $54.31 per archaeological unit ($1.74 per ft^3; $46.99 per yd^3; $62.15 per m^3). Cost per specimen was calculated at be $0.11.

Chapter VII

The Daniels Island Site (38Bk397)
1984 Season

The Daniels Island site (38Bk397) excavated during the 1984 Mark Clark Expressway Project, was selected for assessment of archaeological activities, because it represents archaeological investigations of an historic, rural domestic site. It is also one of two sites in this study not excavated under the auspices of a university, but by a privately owned cultural resource management firm, and detailed documentation of field work, laboratory processing, report writing, and expenses was available and complete.

The Daniels Island site was inhabited for an estimated nine years (ca. 1899-1908 A.D.) by a lower middle class family. It was one of three sites excavated by archaeologists from Garrow and Associates, Inc. from Atlanta, Georgia, under contract with the South Carolina Department of Public Highways and Transportation. The contracting officer, Michael Trinkley, consulted with the S.C. Historic Preservation Officer, the Advisory Council on Historic Preservation, and staff of the National Register of Historic Places to determine mitigation procedures for archaeological sites located in the Project right-of-way. The Project involved the proposed eastern extension of the Mark Clark Expressway (I-526) near Charleston, South Carolina (Brockington, et al 1984:1-3).

The Daniels Island site was excavated from April 27 through June 1, 1984. A final report summarizing archaeological work at this site and two others included in the project was prepared by Garrow and Associates, Inc., Atlanta, Georgia (Brockington, et al 1984).

Site 38Bk397 is located on Daniels Island, Berkeley County, South Carolina within the Atlantic Coastal Plain physiographic province. The site is located on the west central portion of Daniels Island, in a plowed field measuring 100 ft east-west by 300 ft north-south. The topography is uniform, ranging in elevation from 7 to 9 ft above sea level. Site stratigraphy is simple, consisting of approximately 1 ft sandy-clay plow zone overlying sterile sandy-clay and clay subsoil.

Archaeological evidence of a domestic structure was uncovered in an area measuring about 40x40 ft (Figure 13). The structure was probably wooden and rested on wooden or brick piers. It was located adjacent to an unpaved road, forming the southern border of the site. A small surface scatter of artifacts indicated the possible presence of an outbuilding to the north, but test excavations failed to verify a structure.

Data recovered from three trash pits, surface and subsurface units, and a ditch which drained water away from the structure indicated the site had been inhabited for a brief time (9 years) by a lower middle class family. Historical documentation suggested that the site was occupied by a ranch manager. Additional historical records showed that the cattle ranch was owned by a wealthy Charleston resident. As a result of this finding a variant in the landowner-tenant land use pattern was identified.

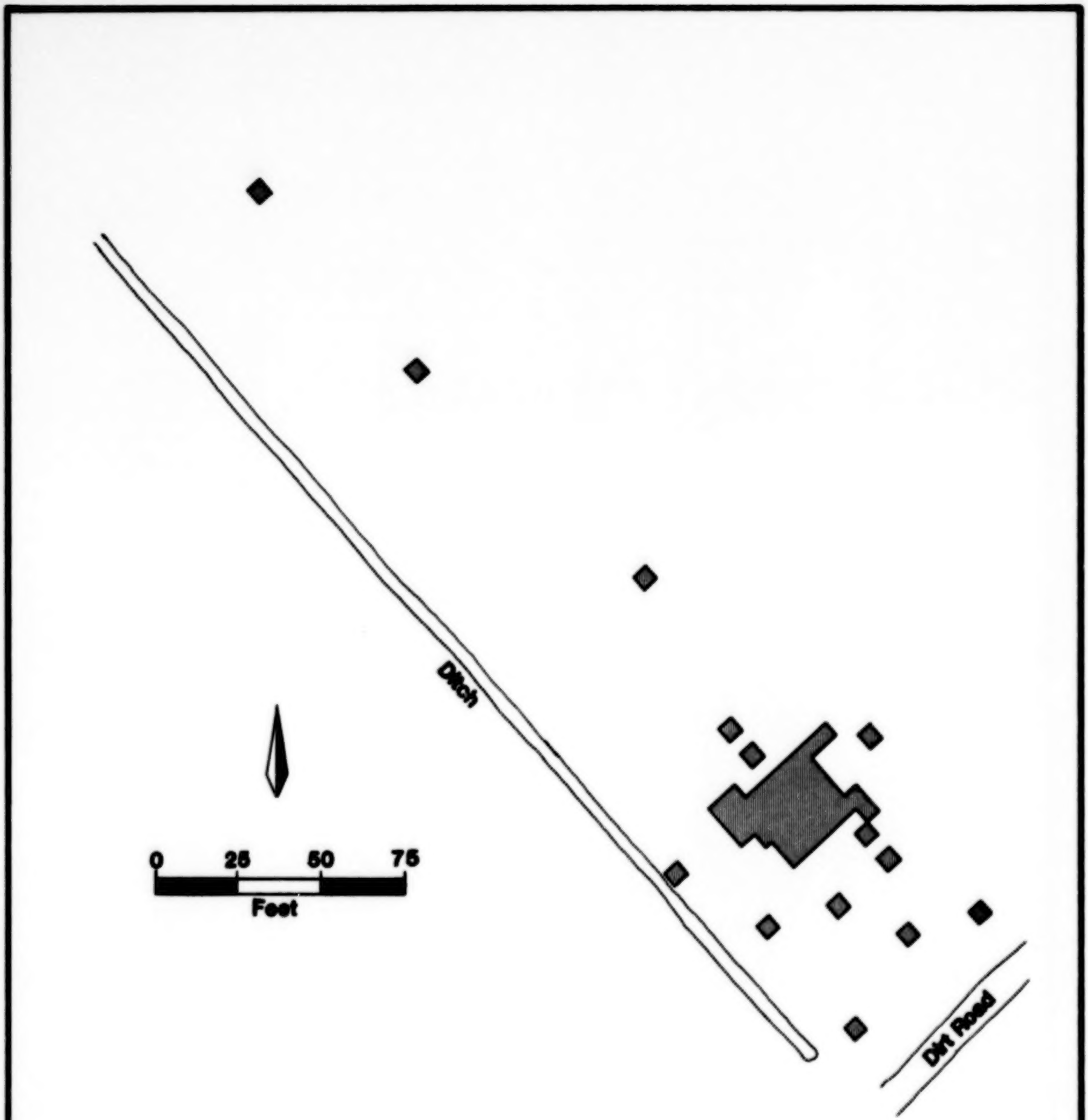

Figure 13. Map of 1984 excavations at the Daniels Island site (38Bk397).

Analysis of Tasks by Person Hours

Planning

The planning and logistics for the project totaled 48.0 person hours. The Project Manager and Field Director each spent 16.0 hours in planning. The two Co-PIs spent 8.0 hours each. Planning hours included time used for initial site inspection, arranging accommodations, discussing field methods, collecting field equipment and consulting with the contracting officer. Table 13 presents a summary of person hours by tasks.

Table 13. Summary of Person Hours by Tasks for Daniels Island Site (38Bk397), 1984 Season.

Activity	Task	Person Hours	
Planning	Logistics/Operation		48.0
Field Work	Project Manager	16.0	
	Supervision	96.0	
	Surface Collection	44.0	
	Primary Excavation	402.0	
	Secondary Excavation	59.0	
	Sifting	426.0	
	Mapping and Photography	85.0	
	Backfilling (manual)	6.0	
	Miscellaneous	84.0	
			1218.0
Laboratory Work	Field Laboratory	154.0	
	Washing, Accessioning, Cataloging	120.0	
	Artifact Conservation and Analysis	320.0	
	Cross-checking field records	40.0	
	Processing photographic records	40.0	
			674.0
Historical Research	Data-gathering	227.0	
	Report Preparation	30.0	
	Typing	14.0	
			271.0
Final Report	Report Preparation	91.0	
	Drafting, Graphics	136.0	
	Typing	53.4	
			280.4
Final Operations	Project Manager		11.0
Total Person Hours			2502.4

Field

Project field work began on April 27 and continued until June 1, 1984, for a total of 24 work days. A total of 1,356.0 person hours was required to complete the field work. The Co-PIs spent a total of 96.0 person hours on site discussing field work progress, excavation strategies and providing general supervision and direction.

The research methods followed in the field were as follows (Brockington, et al 1984:276, 284):

a) A month prior to field work, the site area was plowed to increase surface visibility.

b) A 10-ft grid over the site was placed using a theodolite, 100-ft tapes and wooden stakes.

c) A complete surface collection was made in 170 10x10 ft units. Additional units of high artifact density were collected from the plowed field.

d) Surface artifacts were washed and cataloged, and artifact densities were plotted on surface distribution maps.

e) A metal detector survey (100% coverage) was completed, and the results were plotted on a site map.

f) Based on the results of steps 4 and 5, a series of 5x5 ft test units was established. These units (Figure 13) were placed in both high and low density areas. A total of 47 5x5 ft units and five 5x2.5 ft units were excavated using the following procedures:

> i) Plow zone was removed with shovels and trowels. The interface lens between plow zone and sterile subsoil was designated a separate level.
>
> ii) Unit floors and all possible features were mapped using an engineering scale. All units were photographed with 35 mm cameras, using black and white print and color slide film. At least one profile was drawn for each unit.
>
> iii) Features were recorded, then excavated with trowels and spoons, and recorded again. Flotation samples measuring 1 or 2 liters were taken from each feature. A total of 28 possible features was excavated (one drainage ditch, six post molds, three trash pits, and miscellaneous natural features such as taproot molds).
>
> iv) Both feature and general unit soils were dry-screened through ¼-inch wire mesh.

Person hours for the field work phase were extracted from the Daily Report Forms provided by Michael Trinkley. Person hours totaled 1,218.0 and were differentiated as to specific field tasks. All six members of the field crew were intermittently engaged in all of the various tasks outlined below:

1) Surface Collection, which totaled 44.0 person hours, consisted of 100% collection of 170 10x10 ft units.

2) Primary excavation consisted of plow zone and interface lens removal using shovels and trowels. Plow scars were cut out with shovels, then troweled. This task required 402.0 person hours. The average volume of soil removed for one 5x5 ft excavation unit was 21.93 ft^3 (0.81 yd^3; 0.61 m^3). Total volume of soil extracted was 1,085.29 ft^3 (40.19 yd^3; 30.39 m^3). On the average a unit took 7.7 person hours to excavate (402.0 hours to excavate 52 units).

3) Secondary excavation, which required 59.0 person hours, consisted of work on 28 features. It was estimated that an average feature was excavated in 2.1 hours (59.0 hours to excavate 28 features). The volume of soil extracted from a semicircular drainage ditch was 182.81 ft^3 (6.77 yd^3; 5.11 m^3). The volume of remaining excavated feature soil was figured at 68.00 ft^3 (2.52 yd^3; 1.90 m^3).

4) Sifting, which required 426.0 person hours, was difficult because of the clayey soils. Also, the three trash features contained a dense shell concentration (oyster and clam) and other artifacts, which increased screening time.

5) Time spent cleaning, mapping and photographing totaled 85.0 hours. It was estimated that this task category ranged from 1.0 to 2.0 hours per unit, excluding time spent recording the features.

6) Miscellaneous activities totaled 84.0 person hours. Included in this task category were hours spent constructing an overall site map, completing a metal detector survey, laying the site grid, and bailing out units after rains. The field laboratory was an integral part of the field work, as outlined previously. These hours, however, were combined with Laboratory Processing hours. Person hours for the field laboratory processing and construction of artifact density distribution maps totaled 154.0 hours.

Laboratory

Laboratory processing and analysis of specimens from 38Bk397 took 674.0 person hours to complete (520.0 hours Laboratory and 154.0 hours of Field Processing). Specific activities were washing, accessioning, and cataloging individual artifacts required 120.0 person hours; washing, weighing, and measuring brick consumed 40.0 person hours; conservation of metal artifacts (cleaning and electrolysis) took 80.0 person hours; washing, weighing, and identifying shell used 40.0 person hours; artifact analysis required 160.0 person hours; recording absolute elevations, drawing maps and completing site forms took 40.0 person hours; and accessioning photographs in preparation for curation by the Charleston Museum required 40.0 person hours. Involved in these activities were one PI, the Field Director and two Technicians.

A total of 11,677 individual specimens, as well as weighed amounts of brick, oyster shells and cloth, were recorded from 38Bk397. Of these, 9,419 (80.6% of the total recovered) were included in an artifact analysis. Also, 7,499 specimens (64.2% of the total) were analyzed under the following categories: ceramics, bottle glass, tableware glass, window glass, and lamp glass. The study of these specimens included two analyses of yard proxemics (the surface distribution of artifacts and the distribution of excavated materials). Both studies were conducted to reveal pattern, frequency, and density of the artifacts. Analysis of biological materials was conducted for floral and faunal remains.

A total of 15 liters of soil from trash pits, and the drainage ditch was analyzed in one- and two-liter samples by a subcontractor (Brockington, et al 1984:405-412).

Activities at 38Bk397 included the excavation of 47 5x5 ft units, and five units measuring 5x2.5 ft each. In addition, 28 features (including six post holes) were excavated. Most specimens were recovered from three trash pits. No burials were encountered on the project. The ranges of specimens recovered per unit and per feature were liberally estimated by the Field Director. She estimated that an average unit contained about 75 specimens. Artifact densities were directly related to inter-site functional areas, as expected, and ranged from 0 to 150 per unit. Post mold features, typically had 0 to 1 artifact. The drainage ditch contained about 100 artifacts, mostly metal bottle caps and ceramic fragments. Trash filled features contained about 2,000 specimens, including oyster shell.

Historical Research

Historical Research, which involved 227.0 person hours, consisted of gathering data from oral and documentary sources. Historical research was conducted concurrently with the archaeological investigations. Data-gathering was completed by three researchers and two assistants. The main purpose of this historical research was to uncover and synthesize information about socioeconomic interaction in the Charleston area and relationships between economic and ecological factors (Brockington, et al 1984:48-49). Actual writing of the preliminary historic report was completed by two researchers, for a total of 30.0 hours. This historic research report was typed (14.0 person hours) and sent to Garrow and Associates, Inc. for synthesis with the archaeological results. In total, 271.0 person hours were needed for historical research to be completed.

Report Preparation

This task category included time spent in writing, compiling, typing, and creating graphics for the report. Large sections of the report were authored by the Principal Investigators, which totaled 79.0 person hours. The Field Director used 12.0 person hours outlining and writing rough drafts of some sections. The draftsman used 136.0 person hours creating report graphics pertaining to 38Bk397. Typing the report required about 53.4 person hours to finish one third of the draft report. (The final report involved work at three sites, each requiring about equal time in report preparation.) The Project Manager required 11.0 additional person hours to conduct various administrative duties connected with this site.

Cost of Archaeological Activities

The following information was obtained from a detailed invoice accounting spread sheet provided by Barbara Garrow. This sheet included specific salaries for the various grade levels of employees. Project costs for direct expenses, history and laboratory labor were not differentiated as to the three project sites. As a result, the Field Laboratory Director either estimated the task hours for 38Bk397 or, if uncertain, divided the total cost by three to obtain an estimated cost. As outlined in Table 14 costs were determined for various activity categories.

Table 14. Summary of Cost by Activity for Daniels Island Site (38Bk397), 1984 Season.

Activity		Estimated Cost ($)*
Equipment and Supplies		684.09
Transportation		1967.07
Per Diem		3530.07
Labor		
Planning	772.16	
Field	9601.52	
Historical Research	3862.07	
Laboratory	5805.44	
Report Preparation	3648.08	
Final Operations (Project Manager)	211.53	
		23900.80
Publication		955.83
Special Services		760.00
Overhead/Support		
Labor base and direct overhead (23%)	29397.98	
Above amount and general overhead (53.5%)	45125.90	
		74523.88
Total Estimated Costs		106321.74

* There are no Projected Costs for this site because labor was paid--no volunteers.

Equipment and Supplies

Archaeological expenses for supplies consisted of $448.19 for Expendables, which included stakes, string, film, bags and etc. Field equipment was provided by the firm (screens, wheelbarrows, shovels etc.). The Historians spent $235.90 copying, photocopying and purchasing additional expendables. Combined, a total of $684.09 was used to purchase supplies for this project.

Transportation

One van was rented at $.45 per mile and cost an estimated $767.07 for use while excavating 38Bk397. Four round trip air fares costing about $300.00 each were purchased to fly one principal investigator round trip from Washington to Charleston. Combined transportation costs totaled $1,967.07.

Per Diem

Per diem was initially budgeted at $33.50 per day per crew member (total $4,824.00). Because a portion (about $1,000.00) of this amount was used to pay rent and utilities for a field house on the Isle of Palms, actual per diem was given only for food costs. Total per diem for six crew members was approximately $17.50 per day per person, weekends included ($2,530.07).

Special Services

Site 38Bk397 was plowed about 1 month prior to surface collection. Upon completion of excavations, the site was mechanically back filled. The total cost for subcontracting these activities was $160.00. Cheryl Holt was paid $600.00 to analyze and describe results of ten flotation samples recovered from eight features. She recovered floral and faunal remains through water agitation in a flotation drum. Screen size used was 1 mm wire mesh. A poppy seed recovery test of the efficacy of the process indicated a high recovery rate (92%).

Labor

The total cost for labor was $23,900.80. Labor went into five activity categories (Planning, Field Work, Historical Research, Laboratory Work, and Report Preparation).

1) Planning costs were determined by multiplying the number of hours of an employee by his/her salary rate. The Project Manager received $19.23 per hour for 16.0 hours of planning, logistics and operations tasks for a total of $307.68. The Co-PIs each spent 8.0 person hours in this activity and were paid $19.23 and $16.83, respectively, for a total of $288.48. The Field Director was paid $176.00 for 16.0 hours of planning work.

2) Total labor for field work cost $10,744.16. If the 154.0 field laboratory hours are changed to the general Laboratory costs, Field labor costs decrease by $1,142.64, to a total of $9,601.52. The Project Manager spent 16.0 hours at $19.23 per hour ($307.68) engaged in work related to the field phase of the project. The two Principal Investigators were on site for a total of 96.0 hours at a combined cost of $1,692.48. Hours for the six crew members were determined at 1,260.0 total hours, or 210.0 hours per crew member. Hourly rates for the various crew positions were as follows: Field Director, $12.03 (she received a raise); Senior Technician, $7.50; Technician, $6.25. At site 38Bk397, there was one Field Director ($2,244.00), one Senior Technician ($1,500.00) and four Technicians ($5,000.00).

3) The cost of labor for historical research was $3,862.07. (This was determined by dividing the project total by three to get cost per site). Individual person hours for the various researchers were not recorded on the data sheets. Pay rates for the Historians ranged from $25.00 (one person), to $15.00 (two persons), to $7.00 (two persons).

4) Laboratory costs were also determined by combining the salaries of the various employees involved. (Laboratory costs other than labor were covered by overhead.) PI Garrow was involved in 40.0 hours of analysis at $19.23 per hour ($769.20). The Lab Director was involved in 40.0 hours of supervising, washing, accessioning, and cataloging; 40.0 hours of analysis; and 40.0 hours checking field notes, maps, elevations, and level forms. The pay rate for these 120.0 hours was $12.03 per hour ($1,443.60). The Senior Technician ($7.50 per hour) was involved in washing, etc. (40.0 hours), analysis (40.0 hours), conservation (40.0 hours), and weighing shell and brick (40.0 hours), for a total of 160.0 hours at $7.50 ($1,200.00). Technician hours totaled 200.0 at $6.25 per hour ($1,250.00). Technicians were engaged in most aspects of the laboratory work. Adding field laboratory costs to this total, Laboratory Costs came to $25,043.44 (includes Field Director, $308.69).

5) Report Preparation costs were determined as described above. The Draftsman was paid $7.50 per hour. The Historian's typist received $7.00 per hour ($98.00). The typist at Garrow and Associates, Inc. received $6.25 per hour ($333.75). Total cost for labor involved with Report Preparation came to $3,684.08.

Publication

Publication cost was estimated by combining photocopying cost (archival quality) ($855.83) to the copying cost (about $100.00). Duplication cost was estimated by dividing the cost of making nine draft reports ($300.00) by three (separating the cost for all three sites). Although a final project report has not yet been completed, a total of $5,000 was budgeted for the entire report reproduction process for three sites.

Overhead/Support

Garrow and Associates, Inc., used a figure of 23% of the labor base to determine direct overhead costs. These monies were used to defray insurance costs, FICA and other labor related expenses. This totaled $29,397.98 (123% of $23,900.80). An additional 53.5% of that total was added to the total project cost to defray costs of general office overhead. It totaled $45,125.90 (153.5% of $29,397.98). Actually, these overhead figures on the data sheets were calculated on total labor costs for the entire project (three sites). However, the above figures were based on a projection of overhead as if only one site (38Bk397) had been excavated, using company overhead rates of 23% and 53.5%.

Summary

A total of 2,502.4 person hours were necessary to complete the archaeological investigations at the Daniels Island site, 38Bk397. By combining the costs for all categories, an estimated total of $106,321.74 was required to complete the archaeological investigations at the Daniels Island site, 38Bk397. The total cost of $106,321.74 divided by the number of excavated units (52) produced a unit cost of $2,044.65. The volume costs were calculated as $97.97 per ft^3 ($2,645.48 per yd^3; $3,498.58 per m^3). When the volumes from features and the drainage ditch are included the volume costs are increased to $79.58 ft^3 ($2,148.34 per yd^3; $2,842.07 m^3). From a specimen perspective, the cost per item came to $9.10.

To compare the costs for archaeological activities conducted by a privately-owned business to those conducted by a university (where many Overhead/Support costs are typically absorbed), another figure was calculated. By subtracting the combined overhead figures (used to operate a business) from the total cost ($74,523.88 subtracted from $106,321.74), a cost of $31,797.86 was obtained. This figure divided by the total number of units (52) provided a cost of $611.50 per archaeological unit. Total cost per ft^3 was $23.80 ($642.64 per yd^3; $849.98 per m^3). Recalculating specimen cost, a figure of $2.72 per specimen was obtained.

Chapter VIII

Edgewood Site, (9Da89)
1976 Season

The Edgewood site, 9Da89, was selected as the seventh site for assessment of archaeological activities. It represents archaeological investigations of an historic site, a small neighborhood garbage deposit in a larger urban setting. The work was conducted as part of a Cultural Resource Management contract between the Metropolitan Atlanta Rapid Transit Authority (MARTA) and the Department of Anthropology at Georgia State University (GSU). Detailed information was available for field work, artifact analysis, and report preparation and data pertaining to laboratory processing, conservation of artifacts, and expenses could be easily obtained from site personnel and the GSU Records Office.

Roy S. Dickens directed the project assisted by Gary Barber as Field Archaeologist and Linda Worthy served as Laboratory Supervisor. Several student volunteers were involved in the project, but only the person hours for consistent volunteers could be obtained. Laboratory processing was done by one paid part-time student at the Laboratory of Archaeology, GSU. Conservation of the metal, leather, bone, and cloth artifacts was also carried out by a paid part time student. A portion of the assemblage (predominately Square 1 data) was analyzed in detail by eight students participating in a two quarter classroom project. Although person hours for analysis and report preparation were calculated, no cost figures were obtained, as these students were not paid.

The salvage excavation commenced with site clearing by a bulldozer, and ended with backfilling by bulldozer. The Edgewood site is a residential refuse deposit dating 1910-1911 (Figure 14).

The Edgewood site (9Da89) located in the Piedmont physiographic province is situated on the north side of Dekalb Avenue, adjacent to Clifton Road, approximately five miles east of downtown Atlanta. The site was discovered during MARTA bulldozing of a vacant lot (Figure 15). The lot measured approximately 120 feet (north-south) by 200 feet (east-west).

Historical records indicate that the site is part of Edgewood, a community incorporated as a town in 1898, that existed until annexed by Atlanta in 1909. The site was identified as a small, neighborhood refuse deposit containing predominately domestic artifacts dating to the early 1900s. The refuse had been intentionally deposited to fill a natural ravine and to prepare the lot for house construction. A portion of the foundation of a later house was discovered in Square 1 during excavation. This brick pier and its associated builders trench intruded the refuse deposit. Using deed records and the city directories, a date of 1911 was obtained for construction of the house, which provided a terminal date for deposition of the refuse composing the site.

Archaeological investigations consisted of a controlled surface collection, a systematic metal detector survey to locate areas of densest artifact concentrations, and controlled excavation of two 10x10 ft units. Both units were excavated to a depth of 4.5 ft in 0.5-ft arbitrary levels. Deeper test excavations (a 3x3 ft unit followed by a 1x1 ft post hole digger test) were dug in Square 1 to determine the depth of the cultural deposit. Several layers of naturally deposited sediment were found beneath the cultural refuse indicating episodes of erosion and deposition in the ravine prior to its use as a garbage dump. Significant artifacts were mapped according to their horizontal and vertical positions

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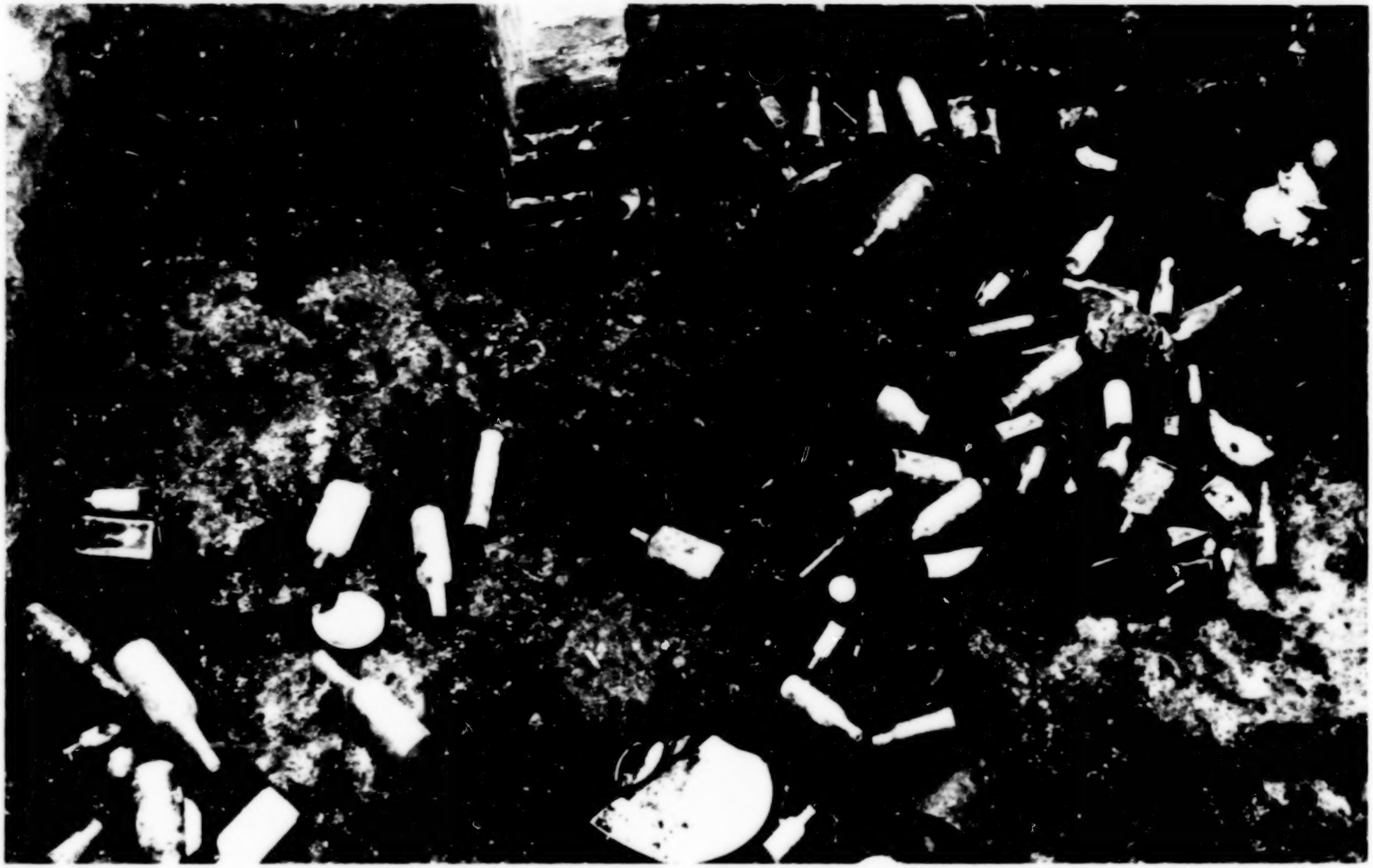

Figure 14. Early twentieth century artifacts exposed at the Edgewood site.

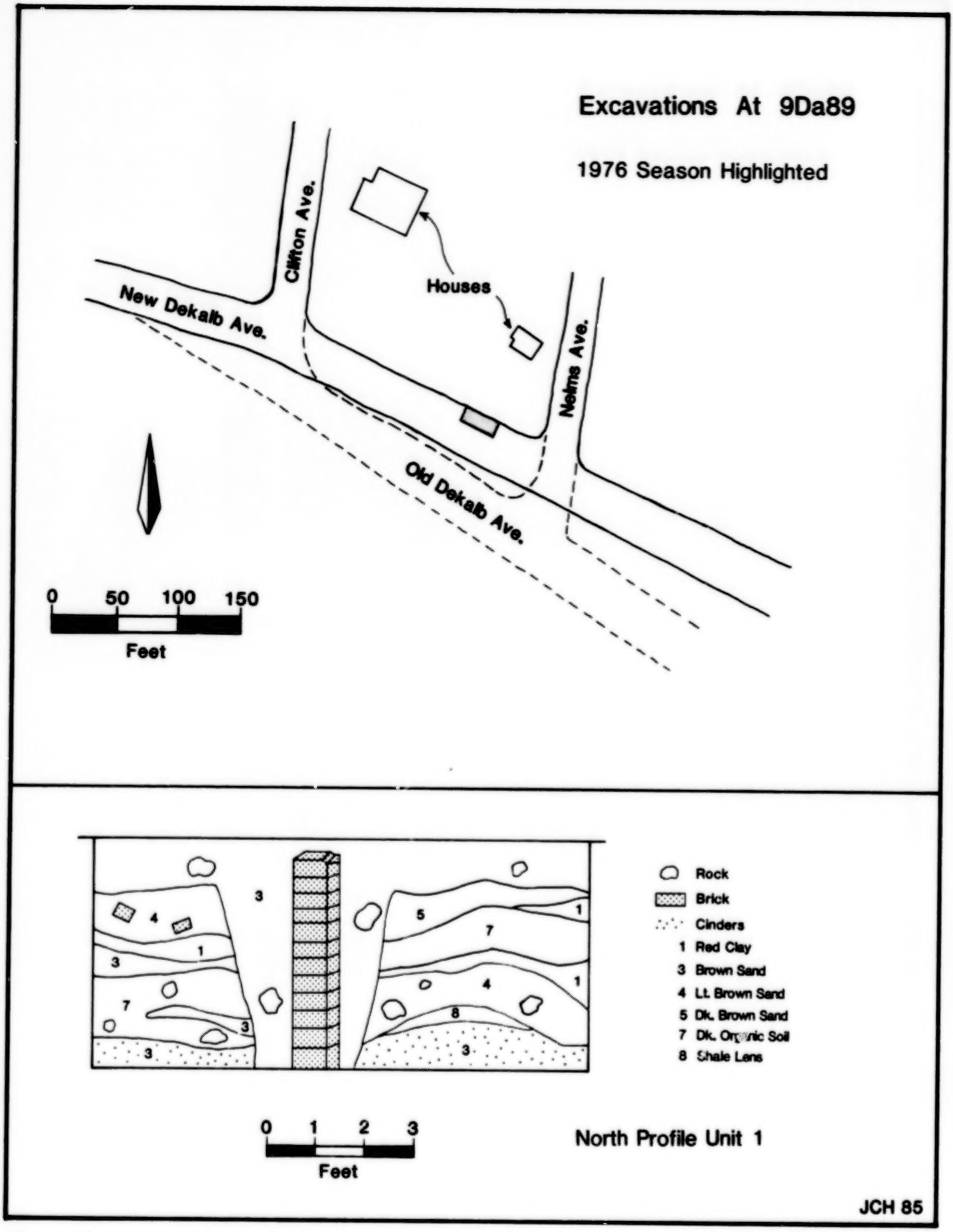

Figure 15. Map of 1976 excavations (and sample profile) at the Edgewood site (9Da89).

with each square and were bagged by level. Scale drawings of horizontal levels and vertical profiles were constructed for both units (Figure 15). The six week salvage excavation of 9Da89 occurring between January 19 and March 3, 1976, provided important information on early socioeconomic development of suburban Atlanta, as well as an immense quantity of material remains.

Analysis of Tasks by Person Hours

Planning

Planning time for this project consisted of field preparations and organization of the site analysis program. The PI spent 10.0 hours in planning field logistics and operations, and 40.0 hours planning the analysis program (a two-quarter classroom project). The Field Director spent 20.0 hours in field preparation. Person hours for this task totaled 70.0. Table 15 provides a summary of person hours for all task categories.

Table 15. Summary of Person Hours by Tasks for the Edgewood Site (9Da89), 1976 Season.

Activity	Task	Person Hours	
Planning	Logistics/Operations	70.0	
Field Work	Surface Collection	16.0	
	Primary Excavation	184.8	
	Secondary Excavation	57.0	
	Screening	251.3	
	Mapping and Photography	143.0	
	Supervision/Consultation (PI)	8.5	
	Miscellaneous	120.0	
	Preparing and transporting artifacts	83.0	
	Archival Research	8.0	
			871.6
Laboratory Work	Washing, Cataloging and Labeling	134.2	
	Conservation of Artifacts	128.5	
	Supervision	175.0	
			437.7
Final Report	Research and Analysis	2000.0	
	Faunal Analysis	54.0	
	Report Preparation	320.0	
			2374.0
Overhead/Support			121.0
Total Person Hours			3874.3

Field Work

The field work phase of the project commenced January 19 and was completed on March 3, 1976, for a total of 45 work days. In total, 780.5 person hours were required to complete the excavation of two 10x10 ft units, one post mold and one builders' trench for a brick pier. An additional 91.0 person hours were used during rain days in preliminary archival (8.0 hours) and artifact preparation and transportation (83.0 hours). In sum, a total of 871.6 person hours were needed to complete the project field work phase.

The sequence of field work and procedures used were as follows:

a) MARTA contacted the archaeologists to inform them that a site had been uncovered by their heavy machinery.

b) The disturbed site area was surface collected (100% sample). A metal detection survey was completed with readings recorded on a site map. Five unstructured post hole digger tests were placed across the site area. Only two of the five tests contained evidence of the trash dump. The combined volume of soil removed for initial subsurface testing measured 20.42 ft^3 (0.75 yd^3; 0.57 m^3).

c) Approximately 3.5 ft of soil was mechanically removed along a 60x15 ft cut. The top 3.0 ft consisted of red clay overburden and brick rubble that overlay 0.5 ft of loose, dark midden.

d) An additional surface collection was completed after the overburden was removed. Next, the site was smoothed with shovels to level the ground surface. A 50 ft (east-west) by 10 ft (north-south) excavation grid was installed using a Brunton compass and tapes. A transit was later set up to map in the five post hole digger tests, the grid, and existing permanent landmarks.

5) Two 10x10 ft units were excavated in ½-ft arbitrary levels to insure spatial control of artifacts and artifact clusters. The midden consisted of sandy, dark soil and artifacts, interspersed with patches of red clay fill. Standard excavation procedures were followed, using shovels for removal of the majority of soil. Trowel work was required where there were numerous or fragile artifacts, and for preparing surfaces between levels. After troweling, the bottom of every level was recorded with both black and white and color photographs and with scaled (½ in = 1 ft) drawings. Artifacts were provenienced by horizontal and vertical (level) location.

In comparison with excavations reported previously, the excavations at 9Da89 were unique. 9Da89 was treated as a feature (a trash dump) within two larger sites (the community of Edgewood and City of Atlanta). All soils removed from the two excavation units consisted of fill and midden. The total volume of soil removed from Square 1 (farthest east) was 464.00 ft^3 (17.18 yd^3; 12.99 m^3). This unit was excavated to a depth of 4.5 ft. Next, an additional 3x3 ft test unit was excavated in the southwest corner of the 10x10 ft unit, to a depth of 8 ft. Finally, a 1x1 ft post hole digger test was excavated to an additional depth of 3 ft. One "sub feature" was uncovered in Square 1, in the northern middle portion of the unit. This was a brick pier extending from Level 1 through Level 4.5. It measured 1 ft (east-west) by about 1.8 ft (north-south). An associated builder's trench measured from 0.5 to 1.0 ft out from the pier. Once recognized, it was excavated separately from the midden fill. Square 2, located immediately west, had 368.00 ft^3 (13.63 yd^3; 10.30 m^3) of soil removed. It contained one "sub feature", a post mold. This post mold, uncovered in the middle of the unit, was first observed in Level 2.5. Its diameter was 0.5 ft and depth was 1.0 ft.

Person hours for the field work phase were extrapolated from the Field Supervisor's field notes. Specific field tasks and combined person hours were recorded daily. Person hours for each task were estimated by assuming that two people could map a floor level in one hour, unless the level was unusually complicated. Plot sheets were examined to determine the level of difficulty in mapping and to estimate the required person hours. It was also very conservatively estimated that two people could complete photographic procedures in 0.5 hour. Troweling was assumed to have taken from 0.5 to 1.0 hour per person per level, unless the floor contained an unusually large number of artifacts. Again, plot sheets were used to determine artifact densities. Shoveling and dry-screening soils were estimated to have taken about equal effort in person hours.

The field crew numbered at least two people, sometimes augmented by volunteer student laborers, per day. The PI's hours of direct supervision and consultation were kept separate from the other task categories. His hours spent photographing the site and taking elevations were combined within those specific categories with those of other field persons. Person hours for the supervisor, field assistants, and volunteers were combined for the following task categories:

1) Surface collection totaled 16.0 person hours. It included all time spent monitoring the second mechanical scraping of the site and all surface collections made prior to excavation.

2) Primary excavation, in this case, included all midden removal accomplished with shovels. It required 184.8 person hours, or 92.4 person hours per unit.

3) Secondary excavation, which required 57.0 person hours, included time spent troweling the interface zones at each level and the post mold soil. This task required 28.5 person hours per unit.

4) All soils were dry-screened through ½-inch wire mesh screen, excluding flotation samples. A total volume of 823.90 ft^3 (30.51 yd^3; 23.06 m^3) was dry-screened for a total of 251.3 person hours. Twenty-seven flotation samples measuring an average 0.30 ft^3 (0.01 yd^3; 0.01 m^3) were taken from each 0.5 ft-level, for a total volume of 8.10 ft^3 (0.30 yd^3; 0.23 m^3).

5) Mapping and photography were accomplished as previously described. It required a total of 143.0 person hours to map and photograph levels, profiles, and the overall excavations. Twenty-three maps and detailed profiles were drawn. Artifacts per arbitrary level were piece-plotted.

6) The Principal Investigator spent a total of 8.5 hours in general site supervision and in consultation with the Field Supervisor.

7) Miscellaneous tasks, such as bailing out units after rain, building screens, gathering equipment, and giving site tours to visitors (which requires more time at urban sites than rural sites), required 120.0 person hours to complete. Field preparation of artifacts and transportation of specimens to the laboratory on rain days required 83.0 person hours. An additional 8.0 hours were used in preliminary archival research during part of one rain day (two people worked 4.0 hours).

Laboratory

Information on specific activities within the category of laboratory analysis was obtained from catalog sheets, the final report, and interviews with Laboratory Supervisor and the Principal Investigator. A total of 437.7 person hours were required to process and conserve 34,760 specimens. Laboratory activities included sorting, washing and cataloging all specimens; conservation of some leather, food bone and a large quantity of metal; and supervision of those tasks. One student laborer spent 134.2 person hours processing specimens. A second student spent 128.5 person hours conserving specimens. The Laboratory Supervisor and Museum Curator spent 175.0 hours supervising the washing, sorting, cataloging, and conserving of artifacts (140.0 and 35.0 hours, respectively).

A total of 34,760 specimens were recovered from surface collections, two of the five post hole digger tests and the excavation of two 10x10 ft units at 9Da89. The majority (32,955 of the 34,760) of specimens were recovered from the excavation units, yielding an average of 39.6 specimens per ft^3 (1,069.2 specimens per yd^3; 1,414.3 specimens per m^3). The highest density of specimens was discovered in the 2.5-3.0 ft Level of Square 1, a total of 5,590 specimens.

Excavated materials from Square 1 totaled 21,684, almost twice that of Square 2. Only materials from Square 1 were analyzed. All materials, however, were processed. The rate of specimens processed per hour, including washing, sorting, cataloging, and labeling 34,760 specimens, and the conservation of numerous leather, bone and metal objects, was 79.4 specimens per hour.

Final Report

Following processing and conservation of the materials recovered from 9Da89, analysis began by sorting the specimens into various categories. Eight undergraduate students were enrolled in a two-quarter (20 weeks) research methods class, which utilized the archaeological materials recovered from this site. It was conservatively estimated that the students spent 10.0 hours per week on their analysis for a total of 1,600.0 person hours (20 weeks at 10.0 hours per week by the eight students). The PI spent approximately 5.0 hours per week on the project, for a total of 100.0 hours (20 weeks at 5.0 hours per week). As part of her duties, the student Laboratory Supervisor spent 300.0 hours assisting and consulting during analysis of the specimens and generating information. These analysis time estimates were obtained from an interview with the PI. Report writing, based on the various categories of analysis, was estimated to take 40.0 hours for each student for a total of 320.0 hours. Of the eight students, five based their research on analysis of specimens from Square 1, two students conducted archival research on the site and surrounding neighborhood, and one student analyzed botanical remains. As Instructor of the class, the PI supervised the research, and edited the students' reports (see References Cited).

As a part of the analysis of the botanical remains from this site, a total of 27 flotation samples was processed. The total of averaged volumes was 8.10 ft^3 (0.30 yd^3; 0.23 m^3), with each sample being 0.30 ft^3. Processing these samples involved hosing the soil through ¼-inch wire mesh and then through window screen. Eight students cooperated in this task for a total of 48.0 person hours.

An additional 4.0 hours were required by one person to label and box the processed samples. As previously mentioned, one student analyzed 14 of these soil samples; 12 samples from Square 1 and 2 samples from Square 2. The total combined volume of the analyzed sample was 3.09 ft^3 (0.12 yd^3; 0.87 m^3).

It should be noted that only the PI's time was counted for cost assessment. The students' time involved in analysis and report preparation was calculated for person hours but not for cost because they were not paid.

Overhead/Support

The services of one curator were required to process the field and laboratory data sheets, and the photographic materials. It was conservatively estimated that 121.0 hours were involved with this task.

Cost of Archaeological Activities

The following information pertaining to costs incurred during archaeological activities at 9Da89 is based on information provided by the Records Office at GSU, preliminary budget figures, interviews with former site personnel, and reasonable estimates. Activity categories include Equipment and Expendables (for field and laboratory), Transporation costs for one vehicle, Storage costs for temporary and permanent facilities, Labor costs for field work, laboratory work, analysis and report preparation, Publication costs for the final report, and Overhead/Support expenses for secretarial duties and university indirect costs. Table 16 provides a summary of costs by Activity for 9Da89.

Table 16. Summary of Cost by Activity for the Edgewood Site (9Da89), 1976 Season.

Activity		Estimated Costs ($)		Projected Costs ($)
Equipment and Supplies		320.00		320.00
Transporation				
One vehicle ($.20 per mile)		100.00		100.00
Storage				
Temporary Laboratory Storage	288.00		288.40	
Permanent Storage and Curation	40.00		40.00	
		328.00		328.00
Labor				
Planning	600.50		600.50	
Field	2228.49		2494.49	
Laboratory	1022.52		1022.52	
Research and Analysis	1041.00		3451.00	
		4892.51		8890.63
Publication				
Final Report	500.00		500.00	
Duplication	400.00		400.00	
		900.00		900.00
Overhead/Support				
Support	$726.00		726.00	
Overhead (GSU)	1750.36		1750.36	
		2476.36		2476.36
Total Cost		9016.87		13014.99

Equipment and Supplies

A combined cost of $320.00 was estimated by the PI. Of this total, $100.00 was spent on field supplies, such as film, bags, string, screen, and plastic bags. Gasoline for the field vehicle is included in the travel category. Laboratory supplies totaled $220.00 and included bags, markers, etc., as well as chemicals required for conservation of the artifacts.

Travel

Approximately 50 miles of total travel was involved, figured on the basis of a 10-mile round trip (from GSU to the site) for 45 field days, and extra mileage for supplies.

Storage

An estimated total cost of $328.00 was required for storage of 9Da89 materials. This category included temporary storage during the laboratory processing at GSU and totaled $288.00. Permanent storage of the artifacts at the University of North Carolina warehouse was figured at $40.00 per year.

Labor

Labor accounted for the highest cost category for the 9Da89 project. Labor cost involved with the Planning phase of the project included 50.0 hours of the PI's time ($10.41 per hour) and 20.0 hours of the Field Supervisor's time ($4.00 per hour), for a total of $600.00. Total labor cost for the field work phase was $2,228.49. The PI received $88.49 for 8.5 hours of direct field supervision. The Field Supervisor received a total of $1,440.00 for 45 eight-hour field days. Each of the two Field Assistants received $1.75 per hour for 25 days, or $350.00 each. Student volunteers worked at the site for an estimated total of 152.0 person hours (approximately 19 of the 45 days) at no additional cost. Projected Costs for field labor (Table 16) reflect cost if volunteers had been paid minimum wage (a difference of $266.00).

Two persons were employed at $1.75 per hour to process and conserve artifacts from 9Da89. Their combined time was 262.7 person hours, which produced a total of $459.72. The Laboratory Supervisor earned $1.80 per hour for 140.0 hours for a cost of $352.80. The museum Curator received $6.00 per hour for 35.0 hours of work, for a total of $210.00. Total cost for laboratory labor was $1,022.52. Only the PI received payment for supervision/instruction of the analysis and report preparation. He received a total of $1,041.00 for 100.0 hours (20 weeks at 5.0 hours per week) at $10.41 per hour. Projected Costs (Table 16) for Research and Analysis reflect the cost if the eight student volunteers had been paid minimum wage for their analysis (a difference of $2,410.00).

Publication

An estimated cost of $500.00 was required to produce the original of the final report. The report included detailed information on artifacts from 9Da89, site history, and field work description. Photographic plates, graphs, and inked maps were included and were prepared at the Laboratory of Archaeology, GSU The cost of duplication for the report came to $400.00 (20 copies at $20.00 per copy).

Support

This cost category covers secretarial and general administrative tasks which totalled $726.00 for 121.0 hours of work.

Overhead

GSU charged $282.21 for staff benefits for the Field Supervisor and PI (8.9% of their salaries) and $1468.24 for indirect cost (51.0% on personal services contracts) for a total overhead of $1,750.45.

Summary

In summary, a total of 3,874.2 person hours were required to complete archaeological investigations at 9Da89. By combining the costs for all categories, an estimated total of $9,016.87 was required to complete the archaeological investigations at the Edgewood site, 9Da89. As a final approach to the assessment of the costs archaeological activities, the total cost was divided by the total cubic feet of soil excavated (two unit volumes, 27 flotation samples, and five post hole digger tests), or 832.00 ft^3. This calculation produced a cost of $10.84 per ft^3 ($292.68 per yd^3; $387.15 per m^3). Projected Costs which included student and volunteer labor totaled $13,014.99. This Projected figure would produce a cost of $15.64 per ft^3 ($422.29 per yd^3; $558.58 per m^3), and $6,507.49 per 10x10 ft unit. Using the Projected Cost figure, a cost per specimen was calculated to be $0.37.

Chapter IX

Third Halifax Jail (31Hx1-H-122)
1984 Season

The Third Halifax Jail was selected for analysis because it represents an investigation carried out by in-house personnel of a government agency. The site is situated in an historic urban context, and the excavations were conducted within an extant structure. Information about cost and person hours for all aspects of this project are complete.

The Third Halifax Jail is a brick structure built in 1838. Archaeological investigations were conducted on the interior lower floor of the building. The field work and concurrent laboratory work lasted 8 weeks. The project was funded by the Historic Sites Section, Division of Archives and History, North Carolina Department of Cultural Resources. Terry Harper and Jack Wilson from the Historic Sites Section served as Principal Investigator and Assistant Principal Investigator, respectively. Linda Carnes was Field Supervisor, and the crew consisted of four archaeologists. One Laboratory Technician and a Laboratory Assistant were employed to complete the artifact processing and partial analysis.

The field work phase of the jail project began on January 18, 1984 and was completed on March 14 (including make-up days for rain delays), for a total of 40 eight-hour days. Laboratory processing took place from February 16 to March 27, 1984. The final report was completed on April 25, 1984.

The Third Halifax Jail (31Hx1-H-122) is located in Halifax County, North Carolina, within the Coastal Plain physiographic province (Figure 16). The site is in the town of Halifax positioned on the west bank of the Roanoke River. The two-story brick structure, erected on the town common in 1838, served as the county jail until 1915 when a larger facility was built a few blocks away. The original building passed into private ownership and served various functions until the 1950s, when it was purchased by the Historic Halifax Restoration Association. The jail and other properties in Halifax were acquired by the State of North Carolina and were designated a State Historic Site in 1965. The 1984 archaeological research was undertaken to investigate the interior jail floor and to provide architectural details for its accurate restoration. More specifically, the investigation represented Phase I research for the jail restoration project.

Two previous wood framed jail buildings had occupied the same town lot. Both were set on fire by escaping prisoners and burned to the ground, the first jail in 1762 and the second jail in 1836. The third jail, therefore, was intended to be fireproof. It was constructed of brick, with interior dimensions of 27.3x27.3 ft, and exterior dimensions of 30.6x30.6 ft. The 1984 archaeological investigations revealed two early occupation floors related to the third jail; one dating from its beginning, 1838 to 1850, and the second from 1850 to 1896. The first floor lasted approximately 12 years and was composed of bricks laid on a sandy clay subsoil. Problems with poor water drainage and excessive humidity created unsanitary conditions in the jail. As a result, in 1848, alterations were proposed in the jail interior to raise the floor surface and increase proper ventilation. The brick floor was apparently removed and reused to construct an inner brick foundation (measuring 20.5x20.5 ft), which supported a wooden floor and an iron cage (subdivided into three cells). This floor lasted until 1896, at which time the wooden floor and iron cage were removed. The interior was filled with borrowed soil and rubble, raising the living surface another 1.5 ft, and then capped with a finished concrete floor. The cells were then reinstalled and indoor plumbing added. Most of this floor

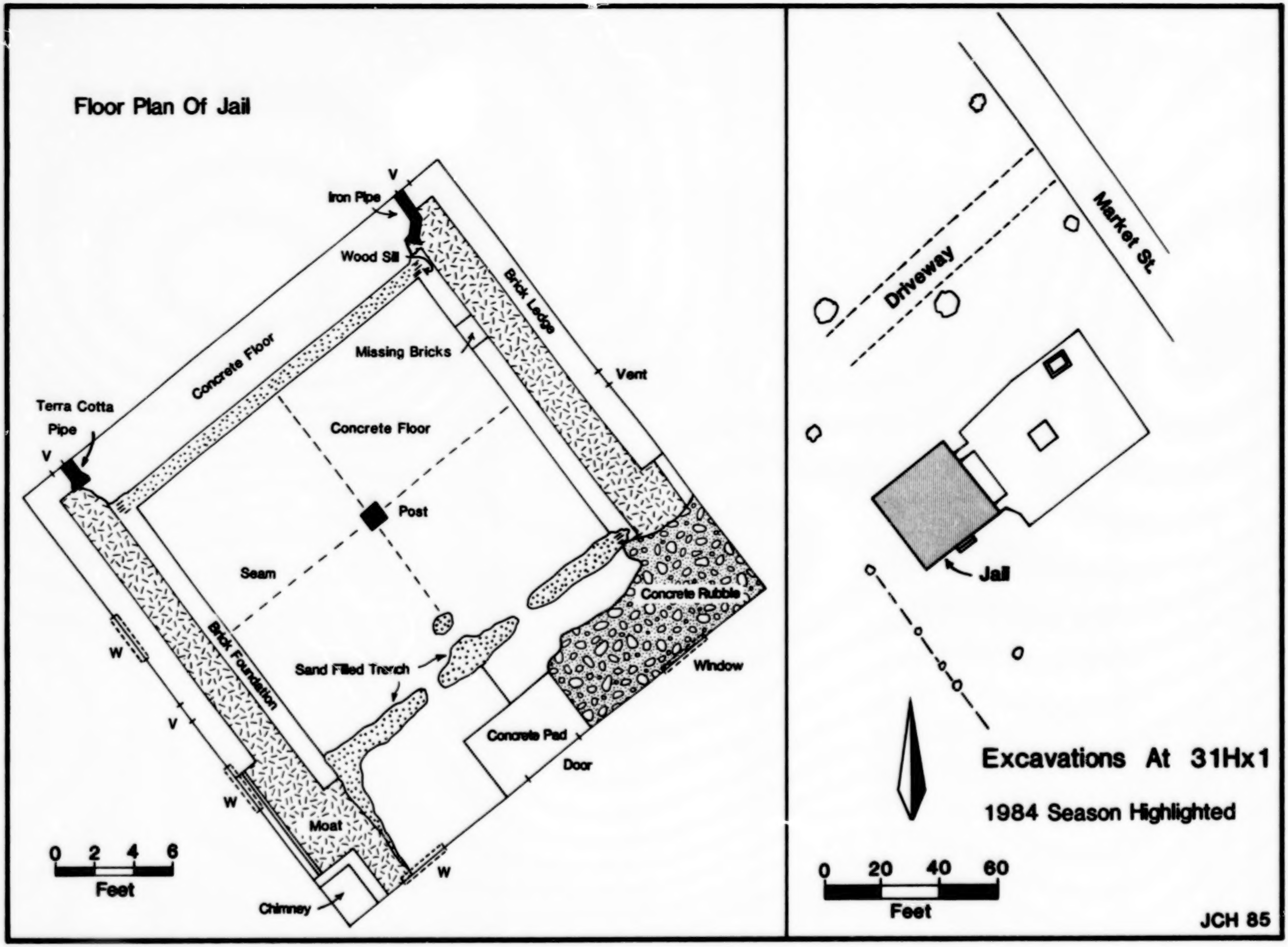

Figure 16. Floor plan and map of 1984 excavations at the Third Halifax Jail (31Hx1).

surface was intact when archaeological work was initiated in 1984. The iron cells and the plumbing, however, had been removed prior to this time.

Archaeological investigations consisted of removal of the concrete floor using a 90-pound jackhammer and a sledge hammer, excavation of Level 1 fill dirt, excavation of Level 2 midden which had accumulated beneath the 1850 wooden floor, excavation of Level 3 soils which represented a mixed fill, rodent disturbed layer, and exposure of remnants of the original 1838 floor. In addition, 23 organic features and/or architectural remnants were revealed during these investigations. Over 57,000 artifacts were also recovered from the jail interior, with Level 2 midden soils containing the highest density. Preliminary artifact analysis was used to assess the chronological sequence of occupation, to offer information on incarceration behavior, and to enhance historic restoration and interpretation of the site.

Analysis of Tasks by Person Hours

Planning

The planning phase of this project required 72.0 total person hours. Included in this time are 40.0 hours spent by the PI to prepare a scope of work, appropriate funds, negotiate contracts, and hire a crew. The Assistant PI spent 2 days (16.0 hours) collecting field equipment and hauling it to the site. Two days (16.0 hours) of the Field Supervisor's time was used in setting up the field house and compiling data forms in preparation for field work. Table 17 provides a summary of person hours for all task categories of the jail project.

Table 17. Summary of Person Hours by Tasks, Third Halifax Jail Site (31Hx1-H-122), 1984 Season.

Activity	Task	Person Hours	
Planning	Logistics/Operations		72.0
Field Work	Removal of Concrete Floor	93.5	
	Primary Excavation	361.0	
	Secondary Excavation	330.5	
	Screening	510.0	
	Mapping and Photography	32.0	
	Supervision/Consultation (PI)	49.0	
	Miscellaneous	161.5	
			1637.5
Laboratory Work	Washing, Cataloging, and Labeling	681.0	
	Supervision	17.0	
			698.0
Final Report	Artifact Analysis	72.0	
	Report Preparation	200.0	
			272.0
Overhead/Support			40.0
Total Person Hours			2719.5

Field Work

Project field work began on January 18 and was completed on March 14, 1984, for a total of 40 work days. A total of 1,588.5 person hours were required to complete excavation of the jail interior to the probable 1838 floor. Also, an additional 49.0 person hours of consultation with the Principal Investigator and her assistant were required. In total, 1,637.5 person hours were needed to complete the field work phase of the project.

The sequence of field work and procedures used were as follows (Carnes 1984:10-24):

> a) A slab of concrete, approximately 0.3 ft thick, and underlying concrete and brick rubble, 1.0 ft thick, were removed using a 90-pound jackhammer. Resulting rubble was carted by wheelbarrow to a State-owned 2-ton vehicle for removal from the site.
>
> b) A protective center balk measuring about 4x4 ft was left around the center support post. Also, a 3.5x5.5 ft area at the doorway was retained for ease of access to the jail interior.

c) As features were encountered, they were brushed, troweled, mapped, and photographed. All architectural features were left intact, except for builder's trenches. The fill from all builder's trenches was removed with trowels, brushes, and spoons. Only one feature (Feature 9) was completely removed. This feature consisted of a backfilled test unit from South's 1966 exploration of the interior, located in the northeast corner of the jail.

d) Upon removal of the concrete rubble, an exposed dirt "floor" was troweled prior to planning further excavations. Five test trenches were excavated using shovels, with trowels used at the interface zones. All soils were screened through ¼-inch wire mesh. Maps and photographs were made at the top of each level. Trench 1 measured 18.5 ft east-west by 1.8 ft north-south. It contained a 1.4-ft thick layer of fill (Level 1) overlying an approximately 0.3 ft-thick midden (Level 2). This rested over a mixed, mottled fill layer (Level 3) which in turn overlay a builder's trench fill and compact clay "balk". Trench 2 measured 18.0 ft east-west by 2.0 ft north-south by 3.5 ft deep. It contained the same stratigraphic sequence, with the addition of a grey-green sand lens mixed with Level 3. Level 3 rested on clay subsoil. Trenches 3, 4, and 5 measured approximately 6x6x3 ft.

e) The inner floor of the jail (which measured 20.5x20.5 ft) was divided into four quadrants to provide horizontal control. All of Level 1 (except for the 0.2 ft interface with Level 2) was shoveled out. Level 1 soils were trowel-sorted.

f) Each inner floor quadrant was troweled to the top of Level 2. The four quadrants were then subdivided into four smaller units. Level 2 soils (midden) were excavated with trowels and screened. Four soil samples were removed from the inner floor midden, measuring 1.0x1.0x0.5 ft each (total volume 2.0 ft^3; 0.07 yd^3; 0.06 m^3).

g) Level 3 soils were removed with shovels, by quadrant. All excavated soils were screened through ¼-inch wire mesh.

h) The interface zone between Level 3 and the top of subsoil or architectural features was troweled. Excavated soils were screened.

This archaeological investigation was different from the others included in this study in that it represented excavation of the interior fill layers within a standing structure. 31Hx1-H-122 was treated as one large feature, containing numerous sub-features, and situated within the larger historic site of Halifax.

Person hours for the field work phase were extrapolated from the Field Supervisor's field notes. Specific tasks were recorded for each work day. Hours often were directly recorded in the field notes by person or combined per task. When specific hours per task were not recorded, person hours were estimated. Estimations were based on the following assumptions: photography per feature or level usually required two people for 0.5 hour, or 1.0 person hour. Often the additional person was needed to position flood lights to illuminate the level or feature being photographed. Mapping time was dependent upon feature or profile size, and ranged from 1.0 to 8.0 person hours. Shoveling and screening were estimated to have taken about equal time, except for screening Level 2 and trowel-sorting Level 1. Those two activities required more person hours, as the Level 2 midden was very rich in artifacts.

The field crew numbered five: four Archaeological Technicians and one Field Supervisor. The time of the Principal Investigator and her assistant was kept separately from the other task categories. The person hours for the five crew members were combined for the following tasks:

1) Removal of concrete and rubble totaled 93.5 person hours. It included all time spent jackhammering the concrete and rubble and removing it to a dump outside the site area. The total volume (27.0x23.0x1.1 ft) thus removed measured 683.10 ft^3 (25.3 yd^3; 19.13 m^3).

2) Primary excavation in this case (as with the previously reported site of 9Da89), included all fill soils removed with shovels. It required a total of 361.0 person hours.

3) Secondary excavation required 330.5 person hours. This task included all time spent troweling interface zones, cleaning features, and troweling out Level 2 (midden).

4) Manual screening and trowel-sorting required a total of 510.0 person hours. All screened soils were sifted through ¼-inch wire mesh. A total volume of 46.62 ft^3 (1.73 yd^3; 1.30 m^3) was screened from Level 1; 298.12 ft^3 (11.04 yd^3; 8.35 m^3) was screened from Level 2; and 474.20 ft^3 (17.56 yd^3; 13.28 m^3) was screened from Level 3. In total, 818.94 ft^3 of soil was removed and screened, and 784.98 ft^3 of soil was removed from Level 1 and trowel-sorted. Combined, the volume of soil extracted from Levels 1 through 3 measured 1,603.92 ft^3 (59.40 yd^3; 44.91 m^3).

5) Person hours for mapping and photography included all time spent measuring and drawing levels, features, and excavation unit plans. All measurements were recorded using Engineering Scale. Photographs were taken in black and white (prints) and color (slides), using 35 mm cameras. Elevations, taken using a standard transit and stadia, were included in this task category. In total, 132.0 person hours were required to complete recording tasks.

6) Field Supervisor's and Principal Investigator's time included all time spent in consultation on excavation methods and interpretation. A total of 49.0 person hours were needed.

7) The Miscellaneous category included all person hours spent in providing site orientation, giving visitor tours, building wheelbarrow ramps, repairing the compressor (for jackhammer), and cleaning the jail area. This category required a total of 161.5 person hours.

A total of 1,637.5 person hours were required to complete the field work phase of the project

Laboratory

Laboratory processing of materials from the jail took 425.0 paid person hours. Included in the total are 408.0 hours spent washing, sorting, and cataloging specimens by one Laboratory Technician for 240.0 hours, one Laboratory Assistant for 120.0 hours, and volunteers, and occasional field crew members for 48.0 hours. The Field Supervisor spent 17.0 hours overseeing laboratory tasks. All laboratory processing was conducted in the field, concurrent with excavation. The majority of volunteer time consisted of washing specimens by the crew members in the evenings and on weekends in their spare time. The crew members spent an estimated 153.0 hours in volunteered artifact processing.

Additionally a local resident contributed 120.0 hours of time. The total time spent in laboratory work was 698.0 person hours (681.0 hours in processing and 17.0 hours supervision).

Materials were cataloged and coded according to South's (1977) functional classification scheme for historic artifacts in order to expedite the final artifact analysis.

A total of 57,270 individual specimens and unquantified amounts of food bone, wood, and soil samples were recovered from the jail interior, to yield a rate of 82.0 specimens processed per hour of laboratory labor (57,270 specimens processed in 425.0 person hours). In comparison to other excavations, this rate is greater because specimens from the jail were not labeled individually, and because no conservation was conducted. The greatest number of specimens (20,473) was recovered from Level 2 (midden). Level 3 yielded the least number of specimens (7,076). Level 1, which represented imported fill dirt, contained 17,957 specimens. The remaining 11,764 artifacts were recovered from the surface or from interfaces between zones and from features.

Final Report

Once all field work and artifact processing were completed, a final report was prepared to fulfill contract obligations and provide a summary of results of the archaeological investigations. As previously mentioned, artifact analysis was enhanced by the cataloging and coding format employed during laboratory processing. Therefore, fewer hours were required to complete a preliminary artifact analysis to be incorporated into the final report. In addition, two volunteers spent two days each summarizing artifact data, for a total of 32.0 person hours. The Field Supervisor spent 40.0 hours reviewing artifact analysis data and compiling tabulations for the report.

The Field Supervisor was also responsible for compiling the final report. This report consisted of 62 pages of text, two artifact summary tables, 13 inked drawings, and ten black and white photographic plates. A total of 200.0 person hours was required to write, photograph, draft, and assemble the final report. By combining artifact analysis hours and report preparation time, a total of 272.0 hours was required to complete this task.

Overhead/Support

The services of one Administrative Secretary, employed by the Historic Sites Section Office, were required to type contracts, process invoices, and establish appropriate bookkeeping files. Her time was estimated to be 40.0 hours total.

Costs by Activities

The following information on cost of archaeological activities for the 1984 field work at the Third Halifax Jail (31Hx1-H-122) is based on actual invoices, personnel records, the final report, interviews with the PI and first hand recollection by the Field Supervisor. As outlined in Table 18, the activity categories include Equipment and Supplies, Storage (permanent), Labor, Publication, Special Services, and Overhead/Support. All costs are actual unless otherwise specified in the text. Unlike previous test cases examined in this study, no costs for Transportation, Housing, or Laboratory Storage were incurred. The field house provided for the crew was state-owned property and situated across the street from the site; therefore, no costs for rent or travel were required. All utilities were paid out of the per diem portion of the crew's salaries. The field laboratory was set up in the rear of the field house and was also rent free.

Table 18. Summary of Cost by Activity for the Third Halifax Jail Site (31Hx1-H-122), 1984 season.

Activity	Estimated Costs ($)		Projected Costs ($)	
Equipment and Supplies		313.34		313.34
Storage		340.00		340.00
Labor				
Planning	736.00		736.00	
Field	18180.90		18180.90	
Laboratory	3110.40		4866.90	
Analysis and Report Preparation	3600.00		3781.12	
		25627.30		27383.80
Publication				
Final Report	216.17		216.17	
Duplication	106.54		106.54	
		322.71		322.71
Special Services				
Faunal Analysis	2000.00		2000.00	
Botanical Analysis	400.00		400.00	
		2400.00		2400.00
Overhead/Support		220.00		220.00
Total Costs		29223.35		31160.97

Equipment and Supplies

Most of the field and laboratory equipment was provided by the contracting agency, and therefore, was property of the state. Some additional equipment was purchased specifically for this project, which included safety goggles, ear plugs, and face masks for jackhammer operations, a drop cord and flood lights for interior lighting, engineer's tapes, rulers, whisk brooms, and five shovels. Purchase of this equipment and the cost of maintenance for the jackhammer and compressor totaled $142.00. Expendable materials included paper and plastic bags, gasoline and oil for the compressor, 11 rolls of film and processing, and a few laboratory supplies (markers, paint, and rubber bands). Cost for

Supplies totaled $171.34, which when combined with Equipment cost ($142.00) yields a total of $313.34 for this category.

Storage

As previously mentioned, no costs for temporary laboratory storage were incurred because all artifact processing was done in the field. Once processing of the artifacts was completed, the materials were permanently stored by the contracting agency. Thirty-four boxes (1.5x2.0x1.5 ft) were required to store the specimens and soil samples. The total volume of the collection was 153 ft^3, and at a cost of $2.20 per ft^3 the storage cost was $340.00.

Special Services

Following completion of field work at the Halifax Jail, two specialists were employed to analyze the faunal and botanical samples recovered during excavations. Bruce Manzano, a faunal analyst, was paid $2,000.00 (200.0 person hours at $10.00 per hour) to identify and analyze a portion of the 17,000+ faunal specimens recovered from the midden zone (Level 2) of the jail interior. Paul Gardner, a botanical specialist, was paid $400.00 (40.0 hours at $10.00 per hour) to identify and analyze floral specimens recovered from four soil samples. Soil samples were processed through the dry-screen technique and small portions were subjected to flotation. Results of the faunal and botanical studies were not included in the final report because they had not been completed at that time. However, they are now on file at the Historic Sites Section Office in Raleigh. In summary, costs for Special Services totaled $2,400.00. No backfilling was done to the jail interior in order to preserve the exposed architectural remnants needed for historical reconstruction and interpretation.

Labor

The total Estimated Cost of Labor for this project came to $25,627.30. The Projected Cost of Labor came to $27,564.92. Of that amount, it should be pointed out that per diem was included in the salaries of the Field Supervisor, the four Crew Members, and the Laboratory Technician during the field work phase. A portion of the per diem for each person was used to pay utilities and food costs. Total per diem for four Crew Members, one Lab Technician; and one Field Supervisor was approximately $21.04 per day, per person, not including weekends.

Labor costs were divided into four task categories; Planning phase, Field work, Laboratory processing, and final Report Preparation.

1) Planning costs were determined by multiplying the number of person hours of each employee involved in this task category by his or her hourly rate. The Principal Investigator received $9.60 per hour for 40.0 hours of her time with this activity. The Assistant PI was paid $7.00 per hour for 16.0 hours of his time, and the Field Supervisor received $15.00 per hour for 16.0 hours of her time. Labor costs for Planning, therefore, totaled $736.00.

2) Per diem was embedded in the salaries of the Field Supervisor and the four Crew Members. The Field Supervisor received $15.00 per hour for 320.0 hours of work, a total of $4,800.00. If one breaks down her wages into salary and per diem, she

received $11.00 per hour ($3,520.00) and $1,280.00 per diem. Crew members received $10.13 per hour for 1,280.0 hours of field work (four crew worked 320.0 hours each), or $12,966.40. If one subtracts per diem, they received $2,400.00 each ($7.50 per hour for 320.0 hours), a total of $9,600.00. The Principal Investigator received $9.60 per hour for 27.5 hours of field consultation, a total of $264.00. Her assistant received $7.00 per hour for 21.5 field consultation hours, a total wage of $150.50. Including per diem, labor costs for field work totaled $18,180.90, ($13,534.50 salaries; $4,646.40 per diem).

3) Laboratory processing of specimens from the jail cost $3,110.40. Of this Estimated Cost total, $2,431.20 was paid to one Laboratory Technician ($10.13 per hour for 240.0 hours), which includes per diem. The Laboratory Assistant received $679.20 in wages ($5.66 per hour for 120.0 hours), which does not include per diem. Volunteered hours of the crew members and supervisor were calculated to determine the projected cost of labor. The supervisor contributed labor worth $594.00, the crew contributed labor worth $742.50 and a local resident contributed labor valued at $420.00. The contributed labor for laboratory work has a dollar value of $4,866.90. Additional time spent in laboratory processing on rain days by the crew members and the supervisor were included in the field labor costs for this project as this time was made up in field work at the end of the project. Laboratory processing includes washing, sorting, and cataloging specimens. It should be noted that individual specimens were not labeled, and that no artifact conservation was performed.

4) The Field Supervisor was paid for 240.0 person hours at $15.00 per hour for artifact analysis and report preparation. This time included analysis, drafting, photography, and writing. Costs for typing the manuscript are included in the Publication category, as the typist was paid a per page rate. Thirty-two hours of volunteer time doing artifact analysis are reflected in the Projected Cost category of Table 18 (32.0 hours at $5.66 per hour amounts to $181.12).

Publication

The cost to produce the original 62-page final report came to $216.71. This figure included the typing expenses for a rough draft and a final manuscript, production of 13 inked drawings, and preparation of ten photographic plates. To fulfill contract specifications with the Historic Sites Section of the N. C. Department of Cultural Resources, 20 copies of the report were duplicated at a total cost of $106.54 ($5.33 per copy). Publication costs totaled $322.71.

Overhead/Support

It was estimated that the services of one Administrative Secretary were required to process employment records and contract data. She was paid $5.50 per hour for 40.0 hours, for a support cost figure of $220.00.

Summary

The total person hours required to complete the 1984 archaeological investigations within the Third Halifax Jail is 2,719.5. Of this time, 80.0 person hours represented unpaid volunteer time (48.0 hours in laboratory processing and 32.0 hours volunteer artifact analysis), and 2,639.5 were paid person hours, and were figured in the cost assessment. By combining the specific costs for all task categories, a total of $29,223.35 was required to complete archaeological investigations at the Third Halifax Jail (31Hx1-H-122). Projected Costs, including volunteer labor, came to $31,160.97. As a final assessment of cost for archaeological activities at this site, the total Estimated Cost was divided by the total volume of soil (including concrete rubble) and produced a cost of \$12.78 per ft^3 (\$345.02 per yd^3; \$456.33 per m^3). If this cost and the additional Projected Costs are used as a base figure, the unit cost rises to \$13.55 ft^3 (\$365.76 per yd^3; \$483.76 per m^3). From a specimen perspective, the value per item was figured to be $0.54.

Chapter 10

Summary and Conclusions

In summary, eight Southeastern archaeological sites were selected for an analysis designed to determine the costs of conducting research at different types of archaeological resources. This information is designed for use as a cultural resource management tool in assessing penalties for vandalism to archaeological sites in accordance with the Archaeological Resources Protection Act of 1979. Since archaeological sites are unique and nonreplaceable cultural resources, it is reasonable to state that no two sites will ever represent exactly the same costs for scientific study. Nonetheless, for reasonable application of the law some effort to rationally and objectively develop guidance for assessing costs must be attempted. In determining the costs of archaeological research the differing conditions and circumstances (and their ramifications on costs) of each type of site must be carefully considered. For this reason, observations for each site covered in this study are presented and the scientific requirements as they effect costs of archaeological activities are discussed.

General comments about relationship of costs to archaeological activities

When assessing the comparative costs of archaeological projects, it is important to note that each archaeological site is unique in some major or minor way and may represent a broad range of spatial and temporal variables. Sites of similar cultural affiliation, time period, and region may be similar, but each is still unique in terms of local physiography, depositional history and material content. Implementation of a particular research design (field strategy) is tailored to the specific site under study and the questions being asked. However, archaeologists apply certain standard field techniques at every site. A grid must be placed across the site using accurate measuring devices, and vegetation and debris must be cleared from the surface. Standard excavation units (i.e., 5x5 ft, 10x10 ft, 2x2 m, etc.) are established over the site or portion of the site. These units are excavated using natural and/or arbitrary levels.

The actual tools of excavation, whether backhoe, shovels, or trowels, effect the amount of time and number of laborers needed. The type of soil and its depositional history, as well as the density and distribution of cultural remains, influence decisions as to what tools and techniques are used. Screening is also directly effected by soil types. Sandy soils, for example, sift much easier than clayey soils. Artifact types and densities also influence labor expenditures involved in screening. Although wide-meshed screens allow for the shortest screening time, they are less acceptable for data recovery. Water screening has a high data recovery rate, but is very time consuming. Mechanical screens greatly reduce sifting time, but may lead to damaged specimens. The choice of one or a combination of screening methods is dependent upon the particular soils, cultural materials, research goals, and time constraints of a project.

The number of excavation units, depth and complexities of stratigraphy, and number and types of features also influences the methods employed and time needed to complete the project. The density and types of cultural remains also effect the amount of time and labor.

Archaeological processing follows standard procedures of washing, labeling, and cataloging specimens. This is the initial phase of laboratory processing. Research institutions may postpone the second phase (detailed analysis) until a future researcher desires to analyze the material. However, researchers working under contract usually must complete some specified amount of analysis to fulfill the stipulations of their contract. Analytic methods may be as simple as counting and identifying objects (Phase 1) or as complex as determining minimum vessel counts, SYMAP construction to show artifact density distributions, functional analyses, and economic scaling (Phase 2 analysis). Research may entail intensive ethnohistoric investigations, comparative site analysis, regional syntheses, and detailed studies by specialists. Conservation measures range from elementary mechanical cleaning to stringent chemical cleaning and elaborate preservation measures.

The magnitude of a final report is dependent upon the amount of research and analysis required to produce a satisfactory report of the work accomplished. Archaeological reports should include general location maps, a specific site map, and drawings of profiles, features and units. Choice of number and types of additional drawings and photographs is usually dependent on the needs of the researcher or contract agency. The required number of copies of reports needed to disseminate the results of the research also varies.

Curation costs and requirements differ by institution. Some repositories charge contractors or project sponsors for storage and curation. Institutions not charging or charging minimum rates for curation usually require archival quality photographic processing, specific artifact processing procedures, and even standard storage tray and box sizes. The labor involved to prepare a collection for curation is often extensive.

Archaeological labor costs vary from project to project and organization to organization. Project field and laboratory directors and assistants are experienced professionals and/or graduate students. The number and relative experience of higher-level staff affects the costs of the project in terms of wages and efficiency (time and quality). At the base of every project are the archaeological laborers, who may be inexperienced or experienced, and who may be professionals, students, or volunteers. Whether these laborers are paid, and the amounts paid, vary by project and institution. The experience of the laborers influences the time needed to complete a project. Although pay rates for laborers vary, institutions and government agencies tend to maintain constant pay scales across regions. If per diem is deemed necessary, the rates will be dependent upon both region and organization. Housing costs, if required, also vary by region and locality. Travel costs may or may not be included, as they are dependent upon number of vehicles, distance to the site, and the possible need to rent vehicles.

Specialists may also be hired. They may be included under labor in the original contract or subcontracted as "consultants." Such specialists may include archival researchers, paleobotanists, paleozoologists, soil scientists, geologists, physical anthropologists or other specialists in branches of science or history.

Factors influencing the various costs of each project include physical aspects of the sites, crew and staff compositions, the extent of laboratory analysis, and the final form of the report. Pertinent factors for each of the eight sites are described below.

Discussion of Factors Effecting Costs for the Eight Test Sites

In Chapter 2 we discussed the 1983 excavations at the Wall site (31Or11). This site was excavated by the RLA and involved a field school program. Many of the students were unpaid, but received course credits. Costs for their labor has been recalculated based on a minimum wage figure. There were also three co-principal investigators who taught the field school and supervised the excavations. Their participation inflated supervisory labor costs. Teaching time also effected excavation time (experienced vs. inexperienced personnel). In addition, a dense midden zone that covered four archaeological units at this site increased screening time. Laboratory processing of artifacts was standard, but analysis activities were extensive for this site. Again, students were involved in the analysis, and labor costs were adjusted accordingly. Finally, the collective papers of the analysts were substituted for a final report (in costs of publication and duplication). Costs in all categories were recent enough not to be adjusted for inflation.

In Chapter 3 we described the costs for archaeological activities conducted at the Upper Sauratown site (31Sk1a). This site was excavated as a research project by the RLA in 1972; therefore, all costs were adjusted for inflation. Standard field and laboratory procedures were followed. Students were paid for their labor; the time of volunteers was adjusted to the current minimum wage rate. Although field records were excellent, no records existed for laboratory work and estimates had to be obtained from site personnel. Only ceramic artifacts were analyzed for that season's work. Testing and excavation were extensive, and multiple features, burials, and post molds were encountered. These complexities increased field time. Keel's final field summary represents a minimum final report.

Research conducted by the RLA in 1973 at the Warren Wilson site (31Bn29) was discussed in Chapter 4. This work was also carried out as a teaching field school, involving unpaid student labor but increasing supervisory costs. Labor figures were adjusted to the current minimum wage rate for the unpaid students. Although standard field and laboratory procedures were followed, no artifact analysis was conducted. Laboratory processing time had to be estimated because there were no records of these activities. Ward's field summary report served as a minimum final report and provided useful field data. Costs were adjusted for the 12 years of inflation.

Chapter 5 presented a cost analysis for excavations conducted in 1979 at the Cold Morning site (31Nh28). This project consisted of salvage excavations at a prehistoric ossuary (multiple human burials), which greatly increased field time because of its delicate and complex nature. The RLA was contracted by the National Park Service to conduct this work. All personnel were paid technicians. A physical anthropologist, hired as a special consultant, and two technicians were responsible for detailed analysis of the human skeletal remains which inflated analysis costs. A final site report was prepared for the contracting agency. Field records were complete, but laboratory time and analysis time had to be estimated. All costs were adjusted for a 6-year interval of inflation.

In Chapter 6 we described archaeological activities conducted in 1965 at the Garden Creek mound site (31Hw1). The site was excavated as a research project by the RLA. The cost of student and volunteer labor had to be adjusted. Daily report forms and supplementary field notes provided most of the management data for this site. Time and costs were estimated for almost all categories. This mound site had very complicated stratigraphy, which increased field time. No specific field summary report was done for this season, but published references describing three years of work on this site served as a reasonable substitute for a final report. A 20-year interval of inflation was included in determining the final costs assessment.

Chapter 7 assessed costs for research conducted in 1984 by a private company under contract with a state agency at the Daniels Island site (38Bk397). All personnel were paid technicians. Supervisory costs were increased by two co-PIs and a project manager. Professional historians and a botanist were hired as consultants. All phases of work were completed using standard field and laboratory procedures. Overhead costs for a private business were calculated and operating expenses itemized. Intensive analysis and conservation also increased laboratory costs for this project. Field activities included survey, testing, and excavation, which increased field time and costs. No adjustment for inflation was necessary for this recent work.

Chapter 8 described archaeological activities carried out in 1976 at the Edgewood site (9Da89). This was conducted by by Georgia State University under a cultural resource management contract with the Metropolitan Atlanta Rapid Transit Authority. Students were paid, but volunteer time had to be added to compute costs. The site was a dense midden of historic remains. The density of remains and the nature of the deposits greatly increased time for screening, troweling, of and recording activities. Field records were complete, but laboratory and analysis time and costs had to be estimated. Like 31Or11 and 31Nh28, extensive analysis was conducted on materials from this excavation. Student analysts were not paid but received course credit for their work. Labor costs were adjusted using the current minimum wage as a base figure. Collectively, the results of the students' work was substituted for a final report. Overhead and retirement funds (GSU) were figured into the costs of this project, and a 9-year interval of inflation was calculated.

Chapter 9 discussed recent (1984) excavations at the Third Halifax Jail site (31Hx1-H-122). This work was funded by North Carolina state government. All personnel were paid technicians. Excavations within an extant structure required some specialized field procedures. Also, dense midden was encountered which greatly increased secondary excavation time (i.e., screening, troweling and mapping). All phases of work were completed and a final report prepared. Field, laboratory, and analysis time and costs were actual and not estimated. Two consultants were also hired for this project. No housing or travel costs were incurred. Per diem figures were embedded in salaries. No conservation was done on the recovered artifacts. No adjustment for inflation was required to ascertain the cost of this project.

Comparison of Adjusted Labor Costs

The archaeological projects described in this report took place between 1965 and 1984. All actual costs changed during those years, especially labor costs. The information summarized in Table 19 was obtained from various agencies in Virginia, North Carolina, South Carolina, and Georgia. The title and respective hourly wage ranges, and subsequent averages, are given for private firms, universities, state agencies, and federal agencies. A combined 1985 wage rate for each position was calculated by averaging the respective hourly wage ranges. In the Southeast, the project directors (Principal Investigator, GS 13/14) average \$16.36 per hour. Field and laboratory directors (Senior Archaeologist, GS 11/12) rate, on the average, \$11.12 per hour. Personnel fulfilling the field and/or laboratory assistant positions (Junior Archaeologist, GS 7/9), are paid an average hourly salary of \$8.33. Crew chiefs and both experienced and inexperienced archaeological technicians receive an average of \$5.58 per hour.

Table 20 lists the adjusted labor costs for each of the eight sites, in terms of ft^3, yd^3, and m^3. Labor costs were recomputed by multiplying the person hours per project per position by the average 1985 wage given in Table 19. Expenditures for labor per ft^3 range from \$5.49 to \$34.15, with an average of \$16.60 per ft^3. Costs per yd^3 range from \$148.32 to \$922.05, with an average of \$448.51. Costs per m^3 range from \$196.19 to \$1,219.64, with an average of \$592.08.

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Table 19. Hourly wage comparisons for private, university, state, and federal archaeological labor by position (1985).

Position Titles	Private Sector ($)		University ($)		State ($)		Federal ($)		Combined* Mean ($)
	Range	Mean	Range	Mean	Range	Mean	Range	Mean	
Project Director Principal Investigator GS 13/14	11.00-20.00	15.50	10.25-27.00	18.63	8.00-10.00	9.00	20.41-24.21	22.31	16.36
Field/Lab Supervisor Senior Archaeologist GS 11/12	8.00-12.02	10.01	7.18-12.80	19.98	7.50-10.00	8.75	14.32-17.17	15.75	11.12
Field/Lab Assistant Junior Archaeologist GS 7/9	7.50-11.00	9.25	4.95-8.60	6.78	6.50-7.50	7.00	8.71-11.84	10.28	8.33
Crew Chief Experienced and Non-experienced Technicians GS 5	3.50-7.50	5.50	3.23-7.00	5.12	3.50-6.50	5.00	7.81	7.81	5.58

* Derived by averaging ranges per position.

Table 20. Soil volume costs calculated from adjusted mean labor costs.

Site	Adjusted Labor Cost ($)	ft^3	\$/ft^3	yd^3	\$/ft^3	m^3	\$/m^3
31Or11	19,902.02	2,196.85	9.06	81.36	244.62	61.51	323.56
31Sk1a	113,533.42	4,866	23.33	180.22	629.97	136.25	833.27
31Bn29	35,175.22	2,962	11.88	109.70	320.65	82.94	424.10
31Nh28	22,317.40	1,006.03	22.18	37.25	599.12	28.50	783.07
31Hw1	35,719.37	9,549.57	3.74	353.69	100.99	267.39	133.59
38Bk397	21,850.58	1,336.1	16.35	49.49	441.52	37.41	584.08
9Da89	27,558.44	832	33.12	30.82	894.17	23.30	1,182.77
31Hx1/H-122	19,916.82	2,287.02	8.71	84.70	235.15	64.04	311.01

Table 21 is included to illustrate the relative costs of the eight archaeological projects when Overhead/Support costs are subtracted from total Projected Costs. Project expenditures in the Overhead/Support categories varied from $220.00 to $74,523.88, dependent upon many variables. Institutions differ as to how overhead or support costs are calculated. Private firms generally compute two percentages to add to project costs, a percentage of labor and an additional percentage of the total costs. This overhead or support is used to cover project related expenditures and general office expenses. The remaining monies are profit. State institutions, including universities, usually calculate a percentage of salaries and wages. These monies are then used to cover project-related managerial expenses. Additional office-related costs are usually absorbed by the institution through other funding measures. Overhead/Support is difficult to standardize between private, university, and state and federal institutions, or even within each type of organization. Table 21 lists the adjusted costs for each project per ft^3, yd^3, and m^3 to compensate for Overhead/Support variables. Costs per ft^3 average $12.81, with a range of $1.66 to $23.79. Costs per yd^3 average $346.16, ranging from $44.76 to $642.51. Costs per m^3 average $456.89, ranging from $59.21 to $849.98. The Projected total costs for each of the eight test cases are listed in Table 22. Relative costs per ft^3, yd^3, and m^3 have been calculated for comparative purposes. The total Projected Costs range from $13,014.99 to $106,321.74. The average total cost for the eight sites is $34,945.87. Projected Costs per ft^3 of excavated soil average $20.60, ranging from $1.74 to $79.58. The Projected Costs per yd^3 are from $46.99 to $2,148.34, or an average of $556.34 per yd^3. The Projected Costs per m^3 are $734.90, ranging from $62.15 to $2,842.07.

In all cost categories, differences between projects can be attributed to several basic factors. Higher costs generally are accrued on projects where: 1) the site is more complex physically and/or culturally, 2) higher level supervision is required, 3) more specialized (technical) background research and/or analyses are necessary, and 4) where the responsible agency or institution has high Overhead/Support charges. Lower costs generally are characteristic of projects having: 1) a less complex site, 2) less high level supervision and more unpaid student and/or volunteer labor, 3) less specialized background research and/or analyses, and 4) lower Overhead/Support charges.

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Table 21. Relative costs per ft^3, yd^3, and m^3 after subtracting overhead/support costs.

Site	Projected Cost ($)	Overhead Support ($)	Adjusted Cost ($)	ft^3	$/ft^3	yd^3	$/ft^3	m^3	$/m^3
31Or11	55,083.33	3,696.00	51,387.33	2,196.85	23.39	81.36	631.60	61.51	835.43
31Sk1a	44,213.04	2,640.00	41,573.04	4,866	8.54	180.22	230.68	136.25	305.12
31Bn29	15,869.40	1,760.00	14,109.40	2,962	4.76	109.70	128.62	82.94	170.12
31Nh28	19,504.08	733.00	18,771.08	1,006.03	18.66	37.25	503.92	28.50	658.63
31Hw1	21,512.29	787.20	20,725.09	9,549.57	2.17	353.69	58.60	267.39	77.51
38Bk397	106,469.99	74,636.13	31,833.86	1,336.1	23.83	49.49	643.24	37.41	850.95
9Da89	12,870.93	2,194.24	10,676.69	832	12.83	30.82	346.42	23.30	458.23
31Hx1/H-122	30,979.85	220.00	30,759.85	2,287.02	13.45	84.70	363.16	64.04	480.32

Table 22. Comparison of costs per ft^3, yd^3, and m^3 (from projected totals).

Site	Projected Cost ($)	ft^3	$/$ft^3$	yd^3	$/$ft^3$	m^3	$/$m^3$
31Or11	55,083.33	2,196.85	25.07	81.36	677.03	61.51	895.52
31Sk1a	44,213.04	4,866	9.09	180.22	245.33	136.25	324.50
31Bn29	15,869.40	2,962	5.36	109.70	144.66	82.94	191.34
31Nh28	19,504.08	1,006.03	19.39	37.25	523.60	28.50	684.35
31Hw1	21,512.29	9,549.57	2.25	353.69	60.82	267.39	80.45
38Bk397	106,469.99	1,336.1	79.69	49.49	2,151.34	37.41	2,846.03
9Da89	12,870.93	832	15.47	30.82	417.62	23.30	552.40
31Hx1/H-122	30,979.85	2,287.02	13.55	84.70	365.76	64.04	483.76

Comparison of 1984 Costs

Of the eight test cases presented in this cost analysis only two represent "current," or 1984, costs. In order provide and up-to-date comparison of costs related to archaeological activities, the remaining six sites are subjected to recalculation based on the national rate of inflation (extracted from The Handbook of Basic Economic Statistics, Vol. 39, No. 1, 1985). Table 23 shows the overall cost of each project for the year each site was excavated and it's Projected Costs brought up to 1984 price equivalent. This calculation was based on the inflation rate of the same year in which each project was conducted.

Table 23. Projected Costs (based on same year inflation rates).

Year	Rate	31Hw1	31Sk1a	31Bn29	9Da89	31Nh28	31Or11
1965	1.029	16620.32	-	-	-	-	-
1966	1.029	17102.30	-	-	-	-	-
1967	1.029	17598.27	-	-	-	-	-
1968	1.042	18108.62	-	-	-	-	-
1969	1.054	18869.18	-	-	-	-	-
1970	1.059	19888.12	-	-	-	-	-
1971	1.043	21061.52	-	-	-	-	-
1972	1.033	21967.16	22576.22	-	-	-	-
1973	1.062	22692.08	23321.23	15285.56	-	-	-
1974	1.110	24098.99	24767.15	16233.26	-	-	-
1975	1.091	26749.88	27491.53	18018.92	-	-	-
1976	1.058	29184.12	29993.26	19658.64	13014.99	-	-
1977	1.065	30876.80	31732.87	20798.84	13769.85	-	-
1978	1.077	32883.79	33795.51	22150.77	14664.90	-	-
1979	1.113	35415.84	36397.76	23856.38	15794.09	-	-
1980	1.135	39417.83	40510.71	26552.15	17578.83	21708.04	-
1981	1.104	44739.24	45979.66	30136.69	19951.97	24638.62	-
1982	1.061	49392.12	50761.54	33270.90	22026.97	27201.04	-
1983	1.032	52405.04	53858.00	35300.43	23370.62	28860.30	55083.33
1984	1.043	54082.01	55581.46	36430.04	24118.48	29783.83	56845.99

Finally, a comparison of the costs per ft^3, yd^3, and m^3 for all sites, based on 1984 prices, is given (Table 24). Based on 1984 rates, the range of cost per ft^3 is $5.66 to $74.58, with an average of $25.87. Costs per yd^3 range from $152.91 to $2,148.34, with an average of $698.80. For costs per m^3, the range is $202.25 to $2,842.07, with an average of $922.79. A total of the 1984 cost equivalent rates provides an average of $49,290.54 for each of the eight sites. Interestingly, the average costs per ft^3, yd^3, and m^3 almost match those costs of the 31Or11 1983 excavation. This observation suggests that when all factors affecting costs of archaeological activities are considered with equal weight, excavations at 31Or11 may represent the "average" archaeological project in terms of costs/person hours.

Table 24: Comparison of Costs per ft^3, yd^3, and m^3 based on 1984 rates for all sites.

Site	1984 Costs	ft^3	$\$/ft^3$	yd^3	$\$/yd^3$	m^3	$\$/m^3$
31Or11	56845.99	2196.85	25.87	81.36	6998.69	61.51	924.17
31Sk1a	55581.46	4866.00	11.42	180.22	308.41	136.25	407.93
31Bn29	36430.04	2962.00	12.29	109.70	332.08	82.94	439.23
31Nh28	29783.83	1006.03	29.60	37.25	799.56	28.50	1045.04
31Hw1	54082.01	9549.57	5.66	353.69	152.91	267.39	202.25
38Bk397	106321.74	1336.10	79.58	49.49	2148.34	37.41	2842.07
9Da89	24118.48	832.00	28.98	30.82	782.55	23.30	1035.12
31Hx1-H-122	31160.75	2287.02	13.62	84.70	367.89	64.04	486.58
Mean	49290.54		25.87		698.80		922.79

In conclusion, it has not been the focus of this cost assessment to determine the most cost-efficient method of archaeological research. Rather, it has examined as many variables as possible which affect costs (and person hours) in order to broaden our awareness of these factors. It also provides an objective estimate of costs which may be used to determine civil penalties for vandalism of archaeological resources pursuant to Section 14 of the Archeological Resources Protection Act of 1979; Final Uniform Regulations (43CFR7, 36CFR296, 18CFR1312, and 32CFR229).

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APPENDIX I

Summary of Qualifications and Interests of Preparers

This study was carried out by personnel of the Research Laboratories of Anthropology, University of North Carolina, Chapel Hill. Dr. Roy S. Dickens, Jr., Director of the RLA served as Principal Investigator. Dr. Dickens, who also holds a Full Professorship in the Department of Anthropology at UNC, specializes in prehistoric and historic archaeology of Southeastern United States, urban archaeology, and cultural resource management. He received his Ph.D. degree from the University of North Carolina, Department of Anthropology in 1970, his M.A. degree in Anthropology from University of Alabama in 1966, and his B.A. degree in history from Georgia State University in 1963. As Principal Investigator for this cost assessment study, his responsibilities included supervision on all aspects of work personnel/contract negotiations, budget management, editing of this report, and liaison to the Technical Officer, Dr. Bennie Keel, National Park Service.

Linda F. Carnes served as Project Supervisor. Ms. Carnes is a graduate student in the Department of Anthropology, and a research assistant with the RLA at the University of North Carolina, Chapel Hill. She was enrolled in the M.A. program at the University of Tennessee at Knoxville between 1979 and 1983, and received a BA degree from Georgia State University in 1975. Her work experience and areas of interest include prehistoric and historic archaeology of the Southeastern United States, urban archaeology, and cultural resource management. As Project Supervisor, her responsibilities included project scheduling, development of the data-collecting instrument and cost-analysis program, compilation of final data on the eight test sites, coordination and supervision of France and Long, editing of their materials for inclusion into the final report, and consultation with Principal Investigator and Technical Officer on progress of the project.

Linda G. France served as the first Research Assistant on this project. Ms. France is also a graduate student in the Department of Anthropology and a Research Assistant in the RLA at the University of North Carolina, Chapel Hill. She received an M.A. in 1984 from the Department of Anthropology at the College of William and Mary, and B.A.in Anthropology in 1978 at the University of North Carolina, Chapel Hill. Her work experiences and interests include historic archaeology, urban archaeology, and cultural resource management. Her responsibilities included assistance in development of the data collecting instrument and cost analysis program, compilation and writing of field work summaries for each of the eight sites, compilation and writing of the Daniels Island site (Chapter 7), and cost assessment summaries for all eight sites presented in Chapter 10, and portions of Chapter 10 text. She and Ms. Carnes completed all secondary editing tasks and subsequent changes in this monograph.

Ann M. Long served as the second Research Assistant for this project. Ms. Long received a B.A. degree from the Department of Anthropology, University of North Carolina, Chapel Hill in 1984. Her interests include prehistoric and historic archaeology of the Southeastern United States, cultural resource management, and urban planning. Her responsibilities for this project consisted of assistance in development of the data collecting instrument and cost analysis program, compilation and writing of laboratory processing data summaries for each of the eight sites, compilation of a bibliography for each chapter, and writing a summary of the cultural resource management laws relevant to this study.

VITA

Roy S. Dickens, Jr.

Address:
Professor of Anthropology and
Director of Research Laboratories of Anthropology
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108 Alumni Building 004A
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Birth Date:
March 16, 1938

Education:
B.A., Georgia State University, 1963
M.A., University of Alabama, 1966
  Thesis: "Archaeology in the Jones Bluff Reservoir of Central Alabama, and Some Implications on Late Prehistoric Subsistence and Settlement Patterns".
Ph.D., University of North Carolina, 1970
  Dissertation: "The Pisgah Culture and Its Place in the Prehistory of the Southern Appalachians."

Teaching and Administrative Positions:
September 1970-August 1971:
  California State College, San Bernardino
  Assistant Professor of Anthropology
September 1971-June 1982:
  Georgia State University
  Assistant Professor of Anthropology (1971-1976)
  Director of Laboratory of Archaeology (1971-1982)
  Associate Professor of Anthropology, with tenure (1976-1982)
  Acting Chairman of Department of Anthropology (1979-1980)
  Director of Center for Applied Research in Anthropology (1981-1982)
July 1982-present:
  University of North Carolina, Chapel Hill
  Associate Professor of Anthropology (1982-1984)
  Professor of Anthropology (1984-present)
  Director of Research Laboratories of Anthropology (1982-present)

Courses Taught:

Introduction to Archaeology, Introduction to Physical Anthropology, Archaeology of North America, Archaeology of Mesoamerica, Old World Archaeology, Archaeology of Southeastern United States, Ancient Civilizations of the New World, Historical Archaeology, Method and Theory in Archaeology, Field Methods in Archaeology (Field School), Laboratory Methods in Archaeology, Cultural Ecology, and North American Indians.

Research and Teaching Interests:

Archaeology and Ethnohistory of Southeastern Indians, Urban Historical Archaeology, Paleoecology, Cultural Resource Management, Ceramics, Information Theory, and Archaeological Field and Laboratory Methods

Professional Memberships and Offices:

- Fellow of the American Anthropological Association, 1970-present
- Society for American Archaeology, 1964-present;
  - Annual Meeting Program Review Committee, 1980
  - Current Research Editor for the Southeast, 1981-present
  - National Historic Landmarks Committee, 1984-present
- Society of the Sigma Xi, 1966-present
- American Association for the Advancement of Science, 1976-present
- Society for Georgia Archaeology, 1974-present;
  - Council 1980-81
- Georgia Academy of Science, 1972-1982
- Association for Georgia Archaeology;
  - Board of Directors and Secretary-Treasurer, 1974-1982
- Georgia Archaeological Research Design Task Force, 1976-1982
- Regents Subcommittee on Archaeological Programs in the University System of Georgia, 1977-1982
- Southeastern Archaeological Conference, 1964-present;
  - Vice President, 1977-78
  - Annual Meeting Local Arrangements Chairman, 1974 and 1979
  - Nominations Committee 1983-84
- Archaeological Society of North Carolina;
  - Executive Secretary, 1982-present
- North Carolina Archaeological Council, 1982-present;
  - Vice chairman, 1983
- Friends of North Carolina Archaeology;
  - Board of Directors, 1984-present

Honors:

- Society of the Sigma Xi, 1966-present
- Fellow, American Anthropological Association, 1970-present
- Member, Goals for Georgia Committee (appointed by Gov. Jimmy Carter), 1971-72
- Research Fellow, Department of Anthropology, University of South Carolina, 1980-81
- Visiting Lecturer, American Anthropological Association, 1975-80

Consultant for:

- National Park Service
- US Corps of Engineers
- US Forest Service
- Georgia Department of Natural Resources
- Georgia Department of Transportation
- Georgia Heritage Trust
- City of Atlanta
- DeKalb County Planning Commission
- DeKalb County Division of Parks, Recreation, and Cultural Affairs
- The History Group, Inc.
- Cultural Resource Services, Inc.
- High Museum of Art

Proposal Reviewer for:
National Park Service
National Science Foundation
National Endowment for the Humanities
National Geographic Society

Grants and Contracts:

Department of the Interior - National Park Service, contract for $16,000 for "Archaeological Investigations at Horseshoe Bend National Military Park, AL," 1973-75

National Register (through Georgia Historical Commission), grant for $6,000 for "An Archaeological Survey of DeKalb, Gwinnett, and Clayton Counties, GA," 1973-75

Georgia Department of Natural Resources, contract for $3,500 for "Archaeological Investigations at Pickett's Mill Battlefield," 1974-79

Department of the Interior - National Park Service, contract for $600 for "An Inventory of Cultural Resources in the Allatoona Review Study Area," 1975

Georgia Department of Transportation, combined contracts for $11,342 for "An Archaeological Survey of Soapstone Ridge - I-675 Impact," 1975-76

Metropolitan Atlanta Rapid Transit Authority, combined contracts for $171,037 for "Anthropological Studies on the MARTA East and West Lines," 1975-79

Historic Oakland Cemetery, Inc., contract for $2,257 for "Archaeological Investigations at Oakland Cemetery, Atlanta, GA," (with Robert L. Blakely), 1978-79

Metropolitan Atlanta Rapid Transit Authority, contract for $57,691 for "Archaeological Studies in MARTA Phase A and B Construction Areas," 1979-8

United States Forest Service, contract for $4,500 for "Archaeological Research at the Plum Grove Site, TN," 1979-81

Department of the Interior - National Park Service, contract for $51,510 for "Data Analysis and Interpretation in the R. B. Russell Multiple Resource Area, GA and SC," 1981-82

Combined foundation grants for $9,000 for "Archaeological Research at Soapstone Ridge, GA," 1981-82

National Geographic Society, grant for $12,973 for a project entitled "The Historic Occaneechi: An Archaeological Investigation of Culture Change," 1984-85

National Park Service (through North Carolina Division of Archives and History), grant for $8,000 for Phase I of "Archaeological Resource Identification and Assessment within the Eno, Haw, and Dan River Valleys," 1984-85

University of North Carolina, Research Council grant for $1500, 1984-85

Publications:

Series:

Interdisciplinary Contributions to Archaeology (series editor), Plenum Publishing Corporation.

Books:

Cherokee Prehistory: The Pisgah Phase in the Appalachian Summit Region, University of Tennessee Press, 1976, 243 pp.

Cultural Resources: Planning and Management (edited with Carole E. Hill), Westview Press, 1979, 204 pp.

Frontiers in the Soil: The Archaeology of Georgia (with James L. McKinley), Frontiers Publishing Co., 1979, 111 pp.

Archaeology of Urban America: The Search for Pattern and Process (editor), Academic Press, 1982, 468 pp.

Structure and Process in Southeastern Archaeology (edited with H. Trawick Ward), University of Alabama Press, 1985, 347 pp.

Exhibition Catalogs:

Of Sky and Earth: Art of the Early Southeastern Indians (editor), Georgia Department of Archives and History, 1982, 96 pp.

Monographs:

"Archaeology in the Jones Bluff Reservoir of Central Alabama." Journal of Alabama Archaeology, Vol. 17, No. 1, 1971, 113 pp.

"Archaeological Investigations at Horseshoe Bend National Military Park, Alabama." Special Publications of the Alabama Archaeological Society, No. 3, 1979, 234 pp.

"Archaeological Investigations at Pickett's Mill Historic Site, Paulding County, Georgia" (with Linda H. Worthy). Georgia Department of Natural Resources, 1984, 144 pp.

Book Chapters:

"Mississippian Settlement Patterns in the Appalachian Summit Area: The Pisgah and Qualla Phases." In Mississippian Settlement Patterns, edited by Bruce Smith, Academic Press, 1978, pp. 115-139.

"The Origins and Development of Cherokee Culture." In The Cherokee Indian Nation: A Troubled History, University of Tennessee Press, 1979, pp. 3-32.

"Laboratory Processing and Curation." In Georgia Archaeological Research Design, Volume 1, edited by Thomas H. Eubanks. Georgia Department of Natural Resources, 1981, pp. 61-71.

"Environmental Impact Archaeology in the Urban Setting: View from Atlanta" (with Timothy Crimmins). In Archaeology of Urban America: The Search for Pattern and Process, edited by Roy S. Dickens, Jr. Academic Press, 1982, pp. 105-113.

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"The Stone Mountain Salvage Project, Part II." Journal of Alabama Archaeology Vol. 11, No. 2, December 1965, pp. 123-132.

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"A Processual Approach to Mississippian Origins on the Georgia Piedmont." Proceedings of the Southeastern Conference, Bulletin 18, 1975, pp. 31-42.

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"Preliminary Investigations at Soapstone Ridge, DeKalb County, Georgia" with Linda F. Carnes). Southeastern Archaeological Conference Bulletin 20 and 21, 1983, pp. 81-97.

Review of Historical and Archaeological Resources of the Boston Area. In Historical Archaeology, Vol. 19, No. 1, in press.

Review of Archaeology of the Central Mississippi Valley. In Archaeology, Vol. 38, No. 1, in press.

VITA

Linda Flowers Carnes

Address:

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Current Status:

Doctoral student in Anthropology, UNC-CH, first year of residency completed.

Employed part time by the Research Laboratories of Anthropology, UNC-CH. Current tasks include Supervisor of a cost assessment for archaeological activities project, National Park Service Contract, and Analyst for historical artifacts recovered in 1983 and 1984 seasons at 31Or231 and 31Or11.

Education:

B.A., Georgia State University, June 1975
M.A., University of Tennessee, A.B.T. (in preparation)

Major Research Interests:

Historical and Urban Archaeology, Archaeology of the Southeastern United States, Southern Folk Culture.

Professional Memberships and Honors:

Southeastern Archaeological Conference, 1975 to present
Society for Historical Archaeology, 1977 to present
Friends of North Carolina Archaeology, 1984 to present
National Trust for Historic Preservation, 1978 to present
Lambda Alpha Honorary Society for Anthropologists, 1976 to present
Recipient of Dean's Key Award for Scholastic Achievement, Georgia State University, June 1975
Research Assistantship for Academic Year 1984/85, RLA, UNC

Employment History:

Student Assistant, Laboratory of Archaeology, GSU, September 1973-September 1974
Student Supervisor, Laboratory of Archaeology, GSU, October 1974-September 1975
Field Supervisor, Norton Road Property Survey, April 1975
Field Supervisor, Winslow Crossing Survey, April 1975
Field Supervisor, Sullivan Road Property Survey, April 1975
Field Supervisor, MARTA Maintenance Facility Survey, May 1975
Field Supervisor, Soapstone Ridge - I-675 Survey, October 1975-March 1976
Field Supervisor, Browning-Ferris Landfill Survey, January 1976
Interim Curator, Department of Anthropology, GSU, June 1976-August 1976
Assistant Archaeological Consultant, History Group, Inc.,
    September 1975-September 1979
Assistant Archaeologist, Atlanta Folk Pottery Project, June-August 1977
Assistant Archaeologist, MARTA Archaeological Project,
    September 1976-December 1977
Field Supervisor, MARTA Archaeological Project, January 1978-September 1979
Crew Member, Tellico Archaeological Project, September 1979-November 1979

Research Archaeologist, Artifact Analysis of Historic Trade Materials from Tomotley Site, October 1979-May 1981
Field and Laboratory Supervisor, Weaver Pottery Site Project, August 1980-May 1981
Research Archaeologist, East-West Mall Redevelopment Project, 1981-1982
Field Supervisor, Soapstone Ridge Archaeological Project, June 1981-August 1981
Historic Artifact Analyst, Tellico Uplands and Below Pool Survey, May 1981
Crew Member, Cumberland Archaeological Research Project, 1981
Crew Member, Big South Fork Archaeological Research Project, 1982
Field and Laboratory Supervisor, Customs House Alleyway Excavations, April-June 1982
Historic Artifact Analyst, 40Mn3, Mouse Creek Site, June 1982
Historic Artifact Analyst, Bell Rattle Site, Winter 1982
Historic Artifact Analyst, 40Ld17, Bussell Island Site, June 1982
Research Archaeologist, Rotherwood Hills Sanitary Sewer Line Project, February. 1982
Research Archaeologist, Archaeological Survey of the Proposed Rogersville 201 Facilities, Hawkins County, TN, March 1982
Part-time Teaching, Knox County School System, Spring 1982
Field and Laboratory Supervisor, Old City Hall Cisterns Excavations, August 1982-November 1982
Field and Laboratory Supervisor, C & C Block Excavation, Knoxville, January 1983-December 1983
Field Supervisor, St. John's Church Project, Knoxville, June 1983
Historic Researcher and Archaeological Consultant, Ramsey House Project, August-September 1983
Field Director, Halifax Jail Project, Halifax, NC, January 1984-May 1984
Laboratory Technician, Historic Sites Section, NC Dept. of Cultural Resources, May 1984-May 1985
Supervisor, Cost Assessment Analysis Project (NPS), RLA, UNC-CH, September 1984-May 1985
Historic Artifact Analyst, 31Or231 and 31Or11, Siouan Project, RLA, UNC-CH, September 1984-May 1985

Publications and Reports:

Roy S. Dickens, Jr. and Linda F. Carnes
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Linda F. Carnes
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Roy S. Dickens, Jr. and Linda F. Carnes
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William R. Bowen and Linda F. Carnes
Historical Search and Recommendations, Archaeological Impact Studies on the MARTA. East, West, North, and South lines, Contract TZ600-M93-03. Laboratory of Archaeology, Department of Anthropology, GSU, 1977

Roy S. Dickens, Jr. and Linda F. Carnes, Timothy Crimmins, and Darlene Roth-White,
Archaeological and Historical Assessment of Phase I Development Area (proposed Golf Course), Milledgeville, Ga., History Group Inc., Nov. 1977.

Roy S. Dickens, Jr. and Linda F. Carnes
Archaeological Survey of the Proposed Crossing of the Colonial Pipeline on the Broad River in Elbert and Madison counties, Ga., History Group, Inc., Nov. 1977.

Linda F. Carnes
Preliminary Investigations of Atlanta Folk Potteries, 1977. In Conference on Historic Sites Archaeology Papers, Volume 12, 1978, edited by Stanley South, University of South Carolina.

Linda F. Carnes, Timothy Crimmins, Roy S. Dickens, Jr. and Steve Grable
An Archaeological and Historical Survey of a Proposed Home for the Elderly in Fitzgerald, Georgia. History Group, Inc., February. 1978.

Linda F. Carnes, Timothy Crimmins, Roy S. Dickens, Jr., and Steve Grable
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Linda F. Carnes and Roy S. Dickens, Jr.
Archaeological Impact Studies of the MARTA North and South lines Contract TZ600-M93-03. Laboratory of Archaeology, Department of Anthropology, GSU, March 1979.

Linda F. Carnes
A Summary of Historic Archaeological Resources Located in Tellico Industrial Area II. Department of Anthropology, University of Tennessee, 1980.

Linda F. Carnes
Preliminary Analysis of Historic Artifacts from the Duke I Site. in Eighth Report of Normandy Archaeological Project, edited by Charles H. Faulkner and Major McCollough, 1982.

Linda F. Carnes
Chapter 5: Analysis of Historic Trade Materials from Tomotley Town Site. In Tomotley Site Report, edited by William Baden. Department of Anthropology, University of Tennessee, 1981.

Linda F. Carnes
Chapter 2: Artifact Analysis and Description for the Weaver Pottery Site. In Archaeological Investigations at the Weaver Pottery Site, edited by Charles H. Faulkner. Report prepared for the Tennessee Department of Transportation, 1981.

Robert A. Pace, Gerald Kline, and Linda F. Carnes
An Archaeological Reconnaissance Survey of the Proposed Rogersville 201 Facilities, Hawkins County, Tennessee. Department of Anthropology University of Tennessee, March 1982.

Linda F. Carnes
Appendix II: An Archaeological Assessment of The Cultural Resources of Blocks 1 and 2, East - West Mall Central City Redevelopment Project No. 2. In Cultural Resource Survey of Blocks 1 and 2, edited by Jefferson Chapman and Stanley Rabun, Department of Anthropology, University of Tennessee and Knoxville City Development Corporation, May 1981.

Linda F. Carnes
Summary Report of the Archaeological and Historical Investigations of Block 3, Central City Redevelopment Project No. 2, Knoxville, Tennessee. Department of Anthropology, University of Tennessee, April 1982.

Linda F. Carnes
Archaeological Assessment of the Cultural Resources in the Central City Redevelopment Project No. 6 . Department of Anthropology, University of Tennessee, August 1982.

Linda F. Carnes
A Preliminary Report of Phase I Archaeological Fieldwork at Block I, Central City Redevelopment Project No. 2. Department of Anthropology, University of Tennessee, June 1982.

Linda F. Carnes
Archaeological and Historical Investigations of the North and South Cisterns, Old City Hall Complex, Knoxville, Tennessee. Department of Anthropology, University of Tennessee, November 1982.

Robert A. Pace, Gerald Kline and Linda F. Carnes
An Archaeological Reconnaissance Survey of the Proposed Pigeon Forge Park, Sevier County, Tennessee. Department of Anthropology, University of Tennessee. October 1983.

Linda F. Carnes
Archaeological and Historical Investigations of the River View Tower Site (formerly the C & C Plaza Site), Knoxville, Tennessee. Department of Anthropology, University of Tennessee. December 1983.

Linda F. Carnes and Jefferson Chapman
An Assessment of the Potential for Archaeological Resources at the Ramsey House Property. Department of Anthropology, University of Tennessee. January 1984.

Linda F. Carnes
Summary Report of the Archaeological and Historical Investigations of the St. John's Episcopal Church Expansion Site. Knoxville, Tennessee. Department of Anthropology, University of Tennessee, January 1984.

Linda F. Carnes
Archaeological Investigations of the Third Halifax Jail, Historic Site Halifax, State Historic Site. North Carolina Department of Cultural Resources, Division of Archives and History, Historic Sites Section, Raleigh, NC April 1984.

William R. Bowen and Linda F. Carnes
Historical and Archaeological Investigations of an Atlanta Folk Pottery: The Rolader Site. In The Atlanta Historical Journal, Volume 28, No. 4, Winter 1984-85

Linda F. Carnes
Book Review of The Traditional Pottery of Alabama by E. Henry Willett and Joey Brackner. In Southeastern Archaeology, Volume 3, No. 2, Winter 1984, William Marquardt, editor.

Linda F. Carnes, Linda France, Ann Long, and Roy S. Dickens, Jr.
Cost Assessment Analysis for Archaeological Activities on Eight Selected Sites in the Southeastern United States. National Park Service Contract with RLA, UNC C.H., 1985).

Linda F. Carnes
Chapter ____ Analysis of Historic Trade Materials from 31Or231 and 31Or11. In final 1984 site report, edited by Roy S. Dickens, Jr., H. Trawick Ward, and R. P. Stephen Davis, Jr., RLA, UNC, C.H. (completion by May 1985).

Linda F. Carnes and Roy S. Dickens, Jr.
Archaeological Investigations at the Fork Creek Mountain Quarry Site (9Da18), DeKalb County, Georgia. For DeKalb County, Division of Recreation, Parks, and Cultural Affairs, Decatur, Georgia. (in preparation).

Professional Presentations:
November 1976, Southeastern Archaeological Conference, Tuscaloosa, AL
January 1977, Augusta Archaeological Society Meeting, Augusta, GA
May 1977, Georgia Academy of Sciences Meeting, Atlanta, GA
October 1977, Conference on Historic Sites Archaeology, Lafayette, LA
September 1978, Conference on Historic Sites Archaeology, Winston-Salem, NC
October 1978, Society for Georgia Archaeology Meeting, Kennesaw, GA
January 1979, Society for Historical Archaeology Meeting, Nashville, TN
November 1981, Southeastern Archaeological Conference, Asheville, NC
November 1982, Conference on Historic Sites Archaeology, Asheville, NC
November 1984, Southeastern Archaeological Conference, Pensacola, FL
January 1985, Society for Historical Archaeology, Boston, MA

Related Skills and Interests:
Archival Documents Research
Preservation and Conservation Techniques
Photography and General Darkroom Work
Drafting and Map Construction
Teaching and Public Presentation
Computer Skills

VITA

Linda Gail France

Education:

B.A. in Anthropology, University of North Carolina at Chapel Hill. 1978

M.A. in Anthropology, College of William and Mary. 1984

Thesis: Sugar Manufacturing in the West Indies.

Ph.D. student in Anthropology, University of North Carolina at Chapel Hill.

Archaeological Experience:

1985 Graduate Research Assistant, Research Laboratories of Anthropology, University of North Carolina, Chapel Hill.

1984 Field and Laboratory Director; Mark Clark Expressway Project, for Garrow and Associates of Atlanta. Three historic rural sites, vicinity of Charleston, SC. Crew member; archaeological excavations of the interior of mid-nineteenth century Halifax Jail, Halifax, NC North Carolina Historic Sites Section, Raleigh.

1982-1983 Research and Teaching Assistant; two summer field schools of the College of William and Mary on St. Eustatius, NA Directed excavations at English Quarter Plantation, involved in ethnographic, ethnohistorical, and general laboratory and teaching activities.

1981-1982 Archaeologist; College of William and Mary, various departmental contracts. Duties included proposal and laboratory analysis. Teaching Assistant; Introduction to Cultural Anthropology.

1979-1981 Archaeologist; Soil Systems, Inc. of Marietta, Ga. Duties included proposal and report writing, archaeological monitoring, survey, testing, block excavations and laboratory analysis. Positions varied from crew member through field director. Sites ranged from prehistoric to rural and urban historic.

1978-1979 Archaeological Technician; North Carolina State Archaeological Branch, Raleigh. Duties included updating site files to computerized forms and maps, also aided volunteer project experiment on NC lithic materials. Crew member; archaeological testing at the Horton Grove site, nineteenth century slave quarters at Stagville Plantation, Durham, for the North Carolina Historic Sites Section, Raleigh. Volunteer at the North Carolina Archaeology Branch, Raleigh.

1977 Student; Archaeological Field School at Clarion State College, Pennsylvania. Multi-component site on Clarion River ranging from Paleo-Indian through nineteenth century.

Professional Papers:

1985 Historiographic Interpretations of Small Farm Sites, circa 1870-1900. Problems and Promises in Plantation Research Seminar, the Charleston Museum.

1984 Stratification in South Carolina Agricultural Society in 1900. Southeastern Archaeological Conference, Pensacola.

Sugar and Slaves: Investigations at English Quarter Plantation, NA Society for Historic Archaeology Conference in Williamsburg.

1983 Archaeological Investigations on St. Eustatius, NA, with Christine Grebey. Williamsburg Chapter of the Archaeological Society of Virginia.

VITA

Ann M. Long

Address:
605 Airport Rd.
Chapel Hill, NC 27514
(919) 967-3311

Education:

B.A. in Anthropology, UNC-Chapel Hill, 1984.

Archaeological Experience:

August 1984-Present: Research Laboratories of Anthropology, UNC - Chapel Hill Research Assistant - compiling data for assessment of costs of archaeological activities at eight sites in the Southeastern US for the National Park Service under the supervision of Dr. Roy S. Dickens, Jr.

June-July, 1984: Archaeological Field School, Department of Anthropology, UNC - Chapel Hill. Participated in the excavation of two aboriginal village sites in Hillsborough, NC

Research Interests:

The relevance of anthropology to urban planning, cultural ecology, cognitive and social factors in environmental degradation, historic preservation and ethnohistory.

Appendix II

Time and Cost of Burial and Feature Excavation
Upper Sauratown site (31Sk1a), 1972 Season

	Burial Number	Person Hours	Cost ($)	Feature Number	Person Hours	Cost ($)
	1	Data not recorded		1	14	24.64
	2	121	212.96	2	5	8.80
	3	68	119.68	3	5	8.80
	4	22	38.72	4	5	8.80
	5	29	51.04	5	6	10.56
	6	50	88.00	6	7	12.32
	7	8	14.08	7	33	58.08
	8	16	28.16	8	8	14.08
	9	36	63.36	9	9	15.84
	10	28	49.28	10	28	49.28
	11	6	10.56	11	20	35.20
	12	23	40.48	12	10	17.60
	13	44	77.44	13	9	15.84
	14	27	47.52	14	3	5.28
	15	19	33.44	15	6	10.56
	16	32	56.36	16	6	10.56
	17	45	79.20	17	16	28.16
	18	45	79.20	18	8	14.08
	19	29	51.04	19	25	40.00
	20	29	51.04	20	7	12.32
	21	11	19.36	21	5	8.80
	22	11	19.36	22	6	10.56
	23	15	26.40	23	22	38.72
	24	31	54.56	24	23	40.48
	25	27	47.52	25	7	12.32
				26	8	14.08
				27	6	10.56
				28	3	5.28
				29	6	10.56
				30	4	7.04
				31	21	39.96
Totals	25	772	1358.72	31	341	603.16

END

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